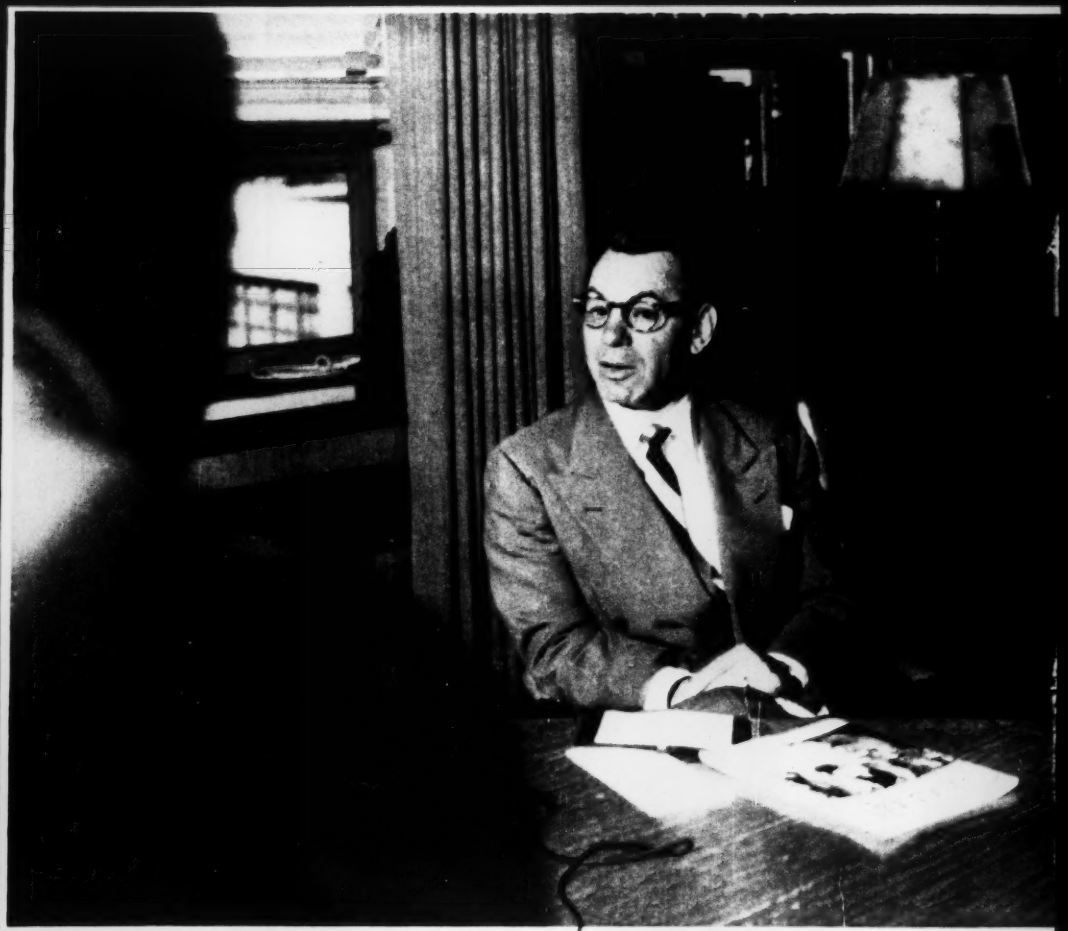
SEPTEMBER 1, 1952

STEEL

THE WEEKLY MAGAZINE OF METALWORKING



A Recorded Interview with R. S. Livingstone, V.P.-Personnel, Thompson Products

HUMAN ENGINEERING

Answers to 20 Questions on Labor Relations

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Clouds on the Labor Horizon, p. 53

Next: Membership Drive on Small Plants, p. 57

U.S.-European Wages: Contrast in Costs, p. 63

ALLIS-CHALMERS
COMPLETE DRIVES

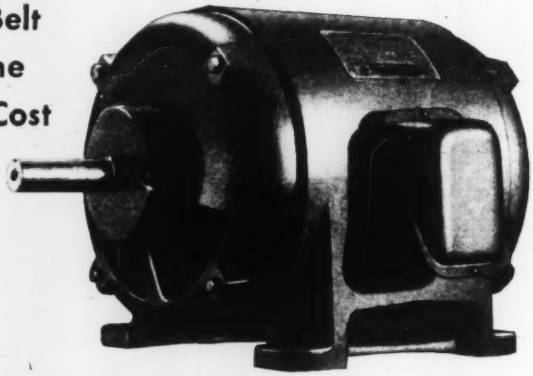
Simplify

YOUR DRIVE DESIGN PROBLEMS

Allis-Chalmers Matched Motors, Control and V-Belt Drives Save Design Time and Cut Manufacturing Cost

CONTROL

Complete matched control for any motor, including manual and magnetic starters, pushbuttons, and variable speed control.



MOTORS

Standard open drip-proof, splash-proof, totally-enclosed, fan-cooled and explosion-proof, ½ hp and up. Also wound rotor and direct current. Special motors to meet your requirements.

Texrope V-BELT DRIVES

Fixed speed and *Vari-Pitch* sheaves with stationary or motion control. Famous grommet belt construction. Most complete line of V-belt drive equipment in the industry.

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Allis-Chalmers Motors and Control	51B6052
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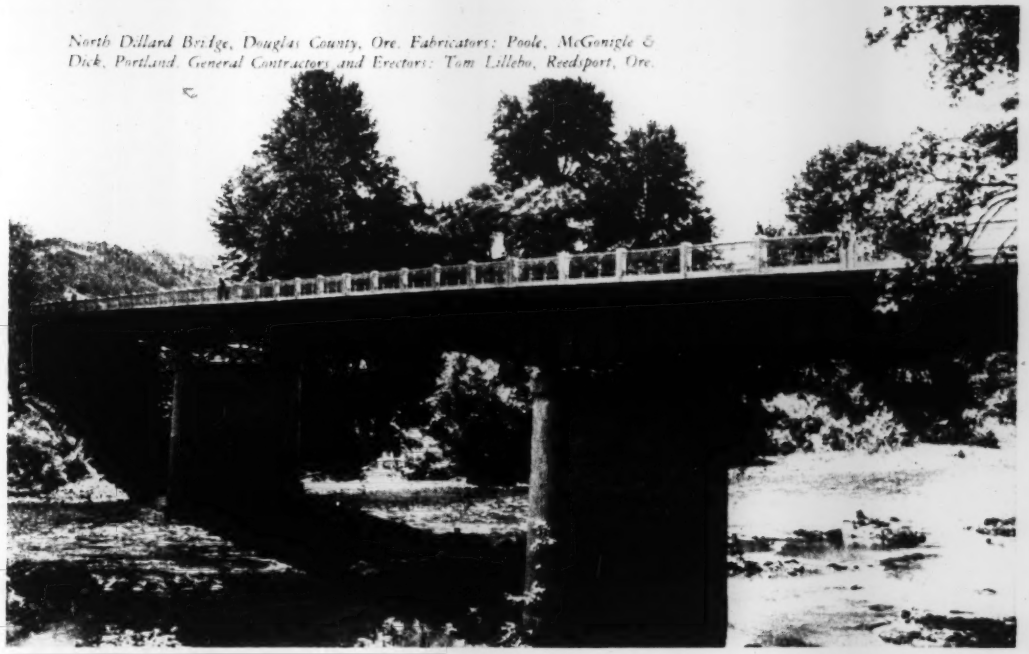

North Dillard Bridge, Douglas County, Ore. Fabricators: Poole, McGonigle & Dick, Portland. General Contractors and Erectors: Tom Lillebo, Reedsport, Ore.

MAYARI R

Replaces Last Timber-Truss Bridge on Pacific Highway

The last of the old timber-truss bridges, once common along the Pacific Highway, has given way to a new deck-girder structure built largely of Mayari R. Spanning the South Umpqua River about 9 miles below Roseburg, Oregon, this bridge is another example of the increasing structural use of low-alloy, high-strength steel.

The bridge consists of 3 continuous-plate-girder spans and 2 reinforced-concrete approach spans. The total length is 504 ft. The floor beams, stringers, girder webs, girder-flange angles, girder-cover plates, and splice material are Mayari R. These parts were designed on the basis of 27,000 psi in tension, which allowed a substantial reduction in the deadweight of the bridge.

Weight-saving is only one of the advantages provided by Mayari R. Besides having almost double the yield point of the structural carbon grade, Mayari R also has 5 to 6 times as much resistance to atmospheric corrosion. It retains paint up to 80 pct longer. It has better resistance to abrasion and impact. And it can be fabricated by the usual methods employed for carbon steel. It is used in the as-rolled condition, without heat-treatment.

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BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Mayari R *makes it lighter... stronger... longer lasting*

America's Largest Selling Brand of L.P.-Gas...

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Why do so many leading manufacturers rely on Philgas? Because this high-quality butane-propane fuel burns clean, there are no harmful contaminants to injure finished products. Fewer operational worries, too, with automatic Philgas systems maintaining constant temperature, atmosphere and pressure (high or low, as desired).

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What advantages does Philgas offer utilities? Again . . . Philgas can be depended upon as a superior, reliable product . . . clean-burning and uniform in thermal values and gravity. Many progressive utilities find it profitable to augment natural or manufactured gas with Philgas. Automatic operation cuts down overhead.

*Philgas is the Phillips Petroleum Company trademark for its high quality propane-butane LP-Gas or bottled gas.

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Offices located in Amarillo, Tex., Atlanta, Ga., Chicago, Ill., Denver, Colo., Des Moines, Ia., Pontiac, Mich., Indianapolis, Ind., Kansas City, Mo., Milwaukee, Wis., Minneapolis, Minn., New York, N. Y., Omaha, Nebr., Raleigh, N. C., St. Louis, Mo., Tulsa, Okla., Wichita, Kans.

Only B. F. Goodrich makes the grommet belts that cut costs 20 to 50%!

Save 3 ways! Investigate today! Write or mail coupon

You save belt costs because belts last longer, save production costs because machines keep running with fewer interruptions, save maintenance costs because they need less attention.

Patented grommet belts by B. F. Goodrich represent the only basic change since invention of the V belt. Belts last 20 to 50 per cent longer, depending on service. (The more severe the service, the greater the increase over ordinary belts.) Grommet belts have more rubber; they're more flexible, give better grip, less slip.

What is a grommet?

A grommet is like a giant cable except that it's *endless*—a cord loop built up by winding heavy cord on itself. There is no overlapping cord *section* as in all ordinary belts. Most belt failures occur in these sections where cords overlap!

All cords put to work

Each of the two grommets and every part of a grommet carry their share of the load. In ordinary belts under high tension the center cords "dish" because tension is greater near the driving faces. Dished cords are doing less work, not pulling their share. Grommet belts have no center cords, there is no dishing—therefore much more strength in proportion to cord volume—and less stretch. Grommet belts stretch, on an average, only about one-third as much as ordinary belts.

Better grip, less slip

Grommet belts have more rubber in relation to belt size. Without any stiff overlap, they're more flexible, grip pulleys better. Size for size, grommet belts give 3½ more gripping power, pull heavier loads with a higher safety factor. Because there is less slip, there is also less surface wear.

Send for proof

Send the coupon for a set of reports telling users' experiences and showing actual installations where grommet belts outlasted all others. Some typical cases:

"... within a few days ordinary belts had stretched ... After six months of 24-hour-a-day service BFG grommet belts haven't stretched at all ..."

"Ordinary belts lasted only 5 or 6 weeks ... B. F. Goodrich grommet belts are in their sixth month of service ..."

"Previous belts suffered from shock loads, wore out fast ... BFG grommet belts have been in service 2 years with no shut-downs..."

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BFG grommet belts cost not one cent more than others. The savings they make for you are clear profit. They are made in C, D and E sections. They are patented by B. F. Goodrich. No other V belt is a grommet belt (U. S. Patent No. 2,255,294).

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B.F.Goodrich

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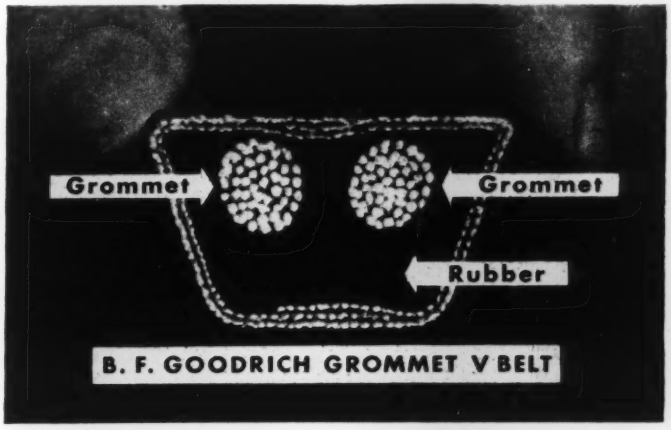

The B. F. Goodrich Company
Dept. S-9
Akron, Ohio

☐ Send set of reports telling users' experiences and showing actual installations proving that B. F. Goodrich grommet belts outlast all others.

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EATON Permanent Mold Gray Iron Castings

Send for your copy of the illustrated booklet, "A Picture Tour of the Eaton Permanent Mold Foundry."

Free machinability
Dense, homogeneous structure
Freedom from leakage under pressure
Machines to high, mirror-like finish
Properly annealed; no growth or distortion after machining

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This Week in Metalworking

STEEL

Vol. 131 No. 9 Sept. 1, 1952

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Educational Exhibit shows advantages of

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PLA-TANK®

All over the Industrial Finishing Exposition at Chicago, the two big words were LUSTER-ON and PLA-TANK. In the Electroplaters' Institute demonstration shown above a complete zinc barrel-plating line turned out these license plate nuts and bolts by the thousand — all brilliantly finished with long-lasting, corrosion-resisting LUSTER-ON dip.

LUSTER-ON is the original passivating bright dip introduced in 1944 by The Chemical Corporation. Since then it has been adopted by many of the leading industries of the country on such items as auto parts, aircraft parts, hardware items, wire goods, television components, electrical parts, tools, etc. Every day former users of nickel and cadmium are converting to this passivating bright dip.

Naturally the tanks, hoods and duct work were all PLA-TANK Resin-Bonded Fiberglas®, the amazing new reinforced plastic material which resists most plating solutions, acids, dips and rinses. PLA-TANK is the pioneer in this field, designed and built by metal finishing men for metal finishing use.

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New di-acro POWERSHEAR

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CONTINUOUS ACTION

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VARIABLE SPEED

for high speed

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The new Di-Acro POWERSHEAR has remarkable speed and accuracy for the production of small parts and pieces. Consider these points:

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Any plant doing high speed precision work on smaller parts from any shearable material cannot afford to be without the DI-ACRO POWERSHEAR. Available in 12" and 24" shearing widths, capacity 16 gauge sheet steel. Also standard model.

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O'NEIL-IRWIN MFG. CO.

Behind the Scenes...

Experiment

To the east of here is an experiment. The editors are trying in STEEL for the first time to wrap up one subject in one issue for you. Since this is Labor Day and labor is a hot subject now, the editors decided to devote most of the news section this week to labor.

Of course all the facets of that vast subject can't be explored in a few pages, but here you'll get the high spots of labor developments that you can expect in the next four to six months. Also you'll find an article on labor's plans for membership drives in the coming year. In that piece the editors tell who is unionized and who isn't, who is likely to undergo an organizational drive soon and what to do in case labor organizers single out your plant. A third article is an interview with Raymond S. Livingstone, a man who has had a lot to do with formulating Thompson Products Inc.'s widely publicized industrial relations program.

The boys upstairs had an interesting time putting the labor material together; we think you'll have an interesting time reading it.

On Guard

Word comes from Connellsville, Pa., that they're holding a man there for stealing a Baltimore & Ohio railroad siding. It seems he admits taking the rails and cutting them up into short lengths. Total weight: 7100 pounds of steel. He sold them for junk and collected $106. At today's prices, that's about 12 per cent of the value of new rails.

Recommendation: Keep all sidings guarded at all times, at least till scrap prices go down.

Question

The editors are always glad to answer legitimate questions about the metalworking industry, and some they get are interesting and may even result in a story lead.

A humdinger arrived a while ago from Chicago. "Have you ever heard of Newcomer steel?" our reader wanted to know. "It's supposed to be a metal cutting steel."

Assistant Editor Bob Huber, our authority on tool steels, searched through four indexes and found no reference to the product. Next he checked with six different tool steel companies and drew a blank. At the seventh company, he got in touch with J. D. White Jr., vice president and general manager of Darwin & Milner Inc., a Cleveland maker of tool steels. He said he vaguely recalled one company that got a tool steel from Newcomerstown, Pa.

Mr. White checked with that firm which said it got nothing from Newcomerstown, but it did get a tool steel from Newcomer Products Co., Latrobe, Pa. That proved to be the answer, the Newcomer steel the reader was trying to trace.

Callus Comfort

American Society for Metals' National Metal Exposition and Congress in Philadelphia next Oct. 20-24 promises "barefoot-ease" comfort at the Philadelphia Convention Halls.

At least that's what the promotional literature holds out as a lure. Some 1.5 miles of deep, resilient rubber-backed carpeting will wind throughout the halls for the comfort of foot-weary delegates.

We'll be there, as barefooted as the next fellow.

Puzzle Corner

Correct answer to August 18th puzzle is as follows: Gold 3.5 oz.; Brass 9.5 oz.; Tin 14.5 oz.; Iron 5.5 oz. First in with that answer were: Guy F. Verney, Truckstell Mfg. Co.; W. G. Laughlin, Jones & Laughlin Steel Corp.; C. S. Morgan, Chandler Chemical Co.; Olga Roberts, Service Iron & Steel Co.; Stan King, Baron Steel Co.; E. H. Weaver, Wilson Fastner Co.; J. C. Tennison Brothers Inc.; Chas. J. Luhn, Jos. Honhorst Co. and R. W. Jernberg, Ingalls Iron Works Co.

Here's one that's not too tough for us now that we've worked it out: I am twice the age that you were when I was your age. When you get to be my age our ages will total 63 years. How old are we? Good luck.

Shrdlu

(Metalworking Outlook—Page 45)

why the swing to dead-burned dolomite?

THE use of dead-burned dolomite by the steel industry has more than doubled in the past 24 years. Consumption per ton of steel is now a third higher than during the war. This steadily rising trend is due to three factors:

1. It saves time. Operation of steel furnaces at near capacity rates demands a repair material that "sets fast and stays fast". Normal maintenance with dead-burned dolomite takes no more time than is required to place the refractory.

2. It reduces bottom delays. The deteriorating quality of charge materials, fluxes and fuels contributes to increased severity of bank and bottom trouble. Proper use of dead-burned dolomite makes it possible to offset the adverse effects of these factors and keep bottom delay down.

3. It lowers refractory costs. Despite the continuing trend toward the use of more dead-burned dolomite, many shops report a reduction in total maintenance refractory expenditures, with consequently lower refractory cost per ton of steel made.

Dead-burned dolomite is now in free supply. Steel producers who have been dependent on other fettling materials can now take advantage of the economies of a dead-burned dolomite practice. Present users, too, may benefit from a more liberal use of this low-cost refractory.

With the completion of its third major dead-burned dolomite expansion in the last ten years, Basic Refractories is prepared adequately to serve the needs of the steel industry with Magnefer and Syndolag.

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Write for free booklet "Underlying Steel". This graphic booklet tells the story in words and pictures of granular basic refractories and their role in the production of open hearth steel. Address Dept. 16.

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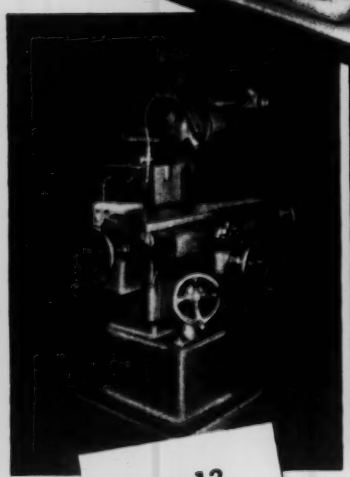
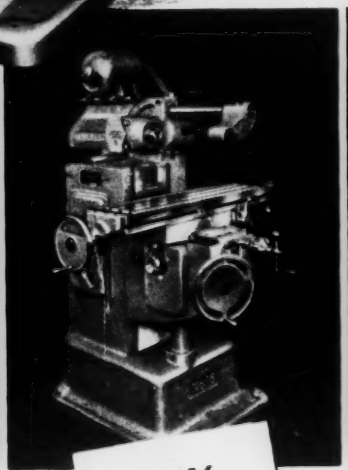
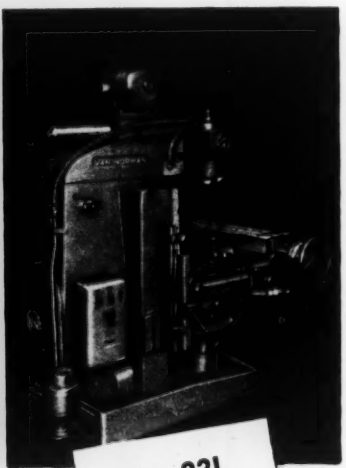


No. 12
Table: 37½" x 9⅜"
Cutterhead in
Angular Position



No. 16
Table: 37" x 9½"
Cutterhead in
Horizontal Position



No. 22L
Table: 45" x 10"
Cutterhead in
Vertical Position

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is Speeded, and More Accurate with

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Featuring the adjustable cutterhead and movable ram, these Millers enable the operator to go from vertical to angular to horizontal milling with a minimum of resetting of work and with standard arbors and cutters. Operation is simplified because the controls are placed right at the operator's fingertips. Rigidity to maintain accuracy on the heaviest cut is assured by the balanced design of each machine.

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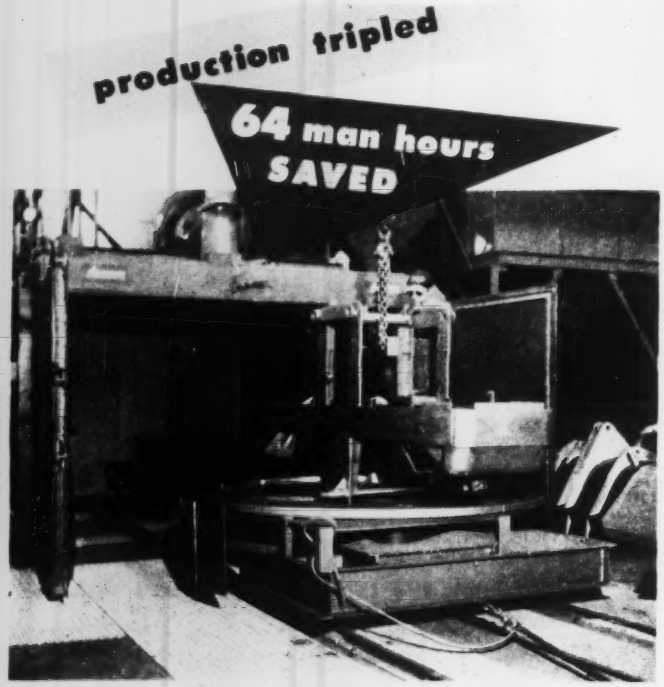
No. 26
Table: 58" x 13"
Cutterhead in
Angular Position

No. 36
Table: 64" x 14"
Cutterhead in
Horizontal Position

No. 38
Table: 64" x 14"
Cutterhead in
Horizontal Position

COMPANY, SPRINGFIELD, MASSACHUSETTS, U. S. A.



cleaning weldments for Frank G. Hough Company with a

WHEELABRATOR®

Welding spatter and flux is removed in minutes by the airless Wheelabrator to save hours of wire brushing, grinding and chiseling. Welded areas are spotlessly cleaned to provide a perfect anchor for bonding the final finish.

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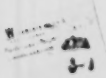

The use of the Wheelabrator in the welding industry is described in the bulletin, "How Weldments are cleaned faster and cheaper with a Wheelabrator." Airmail your request for a free copy today.

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LETTERS TO THE EDITORS

Hour of Decision Is Here

WE REQUEST PERMISSION TO REPRINT EDITORIAL "NOW OR NEVER" (July 21, p. 55) IN 2500 PAMPHLETS DIRECTED TO EMPLOYEES, STOCKHOLDERS AND CUSTOMERS. WITH ANNUAL REPORT STEEL WILL BE CREDITED.

C. A. Dunham Co.
Chicago

• *Permission granted.—ED.*

Spray Coatings Replace Metal

Your article "Phosphatizing . . . Versatile Substitute for Metallic Coatings" (Jan. 28, p. 64) has aroused interest in many of our customers who use Parker products.

Of particular interest is the illustration on p. 64 with the heading "Portable spray gun may be used to apply a paint-bonding zinc phophate coating to large sheet steel products like this refrigerator assembly." It would be extremely helpful if you could advise the source of this photograph and the name of the company using the phosphate coating treatment by this application.

M. B. Rosen
sales manager
Parker Rust Proof Co.
Detroit

• *Photograph was supplied by American Chemical Paint Co., Ambler, Pa. The information describes their "Granodine" process being used in a portable hand spray process to form a paint bonding zinc phosphate coating.—ED.*

Die Shops Are Exempted

Your article "WSB: New Faces, No Teeth" (July 14, p. 60) speaks of a benefit group, from which the tool & die shops seem to be excluded. Do you have any detailed information on this subject.

T. G. O'Meara
City Tool & Die Co.
Muncie, Ind.

• *The ESA order regarding small business exemptions from wage control is General Order 17, issued July 29. Note that among nine categories of small business remaining under control are the tool & die shops.—ED.*

For Services Rendered

I think you and your editors deserve the highest praise for the special report on resistance welding, "Resistance Weld-

tool steel is our fair-haired boy!

We are definitely partial toward *our* tool steel. Especially since users have verified our opinion of them by making us the country's number one producer of fine tool steel.

Naturally, we intend to maintain this position. Therefore, Crucible research and development is forging ahead, supplying industry's need for new, improved tool steels . . . Crucible makes its long experience freely available to you through its metallurgical service . . . And Crucible provides you with prompt delivery of tool steel, from its completely stocked warehouses, conveniently near you.

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Ketos®
AirKool Die Steel
Airdi® 150
Nu-Die V Die Casting Steel
CSM 2 Mold Steel
La Belle® Silicon #2
Atha Pneu

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ACCO Registered Sling Chains are Versatile

● Here an ACCO *Registered* Sling Chain is used in a double basket hitch. It could also be used as a two-legged bridle, or as a double choker. The tough 125 Endweldur ACCALLOY Chain is much lighter in weight and is easy to handle. It has great service life. The permanent identification ring on every ACCO *Registered* Sling Chain is your sign of safety and guarantee of quality.

See your AMERICAN CHAIN distributor. He'll show you how easy and economical it is to choose and use the best sling chains made.

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AMERICAN CHAIN & CABLE

American Chain

TRADE MARK

York, Pa. Atlanta Chicago Denver Detroit Los Angeles
New York Philadelphia Pittsburgh Portland
San Francisco Bridgeport, Conn.

LETTERS

Continued from page 10

ing Applications Increase," (July 21, p. 91).

It is a thought-provoking article, one which will make management men stop and seriously consider the time and cost saving advantages of resistance welding in comparison with other methods of joining, and to test their ingenuity in tooling up for multiple welds at still greater cost saving.

Resistance welding needs such a boost now and then.

Allan L. Percy
Fansteel Metallurgical Corp.
North Chicago, Ill.

U.S. Furnace for Germany

You may be interested to know that H. A. Brassert & Co. Inc., has a contract to engineer and supervise construction of a blast furnace for Westfalenhutte A. G., Dortmund, Germany. It will be of modern American design in its principal features and will be one of the largest blast furnaces in Europe.

Initial hearth diameter will be 26'6" with provision for expanding to 28'. This furnace will increase Westfalenhutte's ingot capacity from approximately 1.2 million tons to 1.7 million tons per year. At present, it's anticipated that the unit will be blown in late in 1953.

Frank Senior, president
H. A. Brassert & Co. Inc.
New York

Business Clinics Click

Everyone I have talked to in the Chicago area thinks the clinic type approach to problems of business, as outlined in your article "Industry Helps Educate the Educators" (July 28, p. 58), is a great step in the right direction. Your editors should be highly commended for their foresight.

William C. Prettyman
Reliance Electric & Engineering Co.
Chicago

New One-Step in Analysis

I would like to get more information on the rapid one-step procedure for determining copper in alloy steel (July 14, p. 117), as developed by National Bureau of Standards.

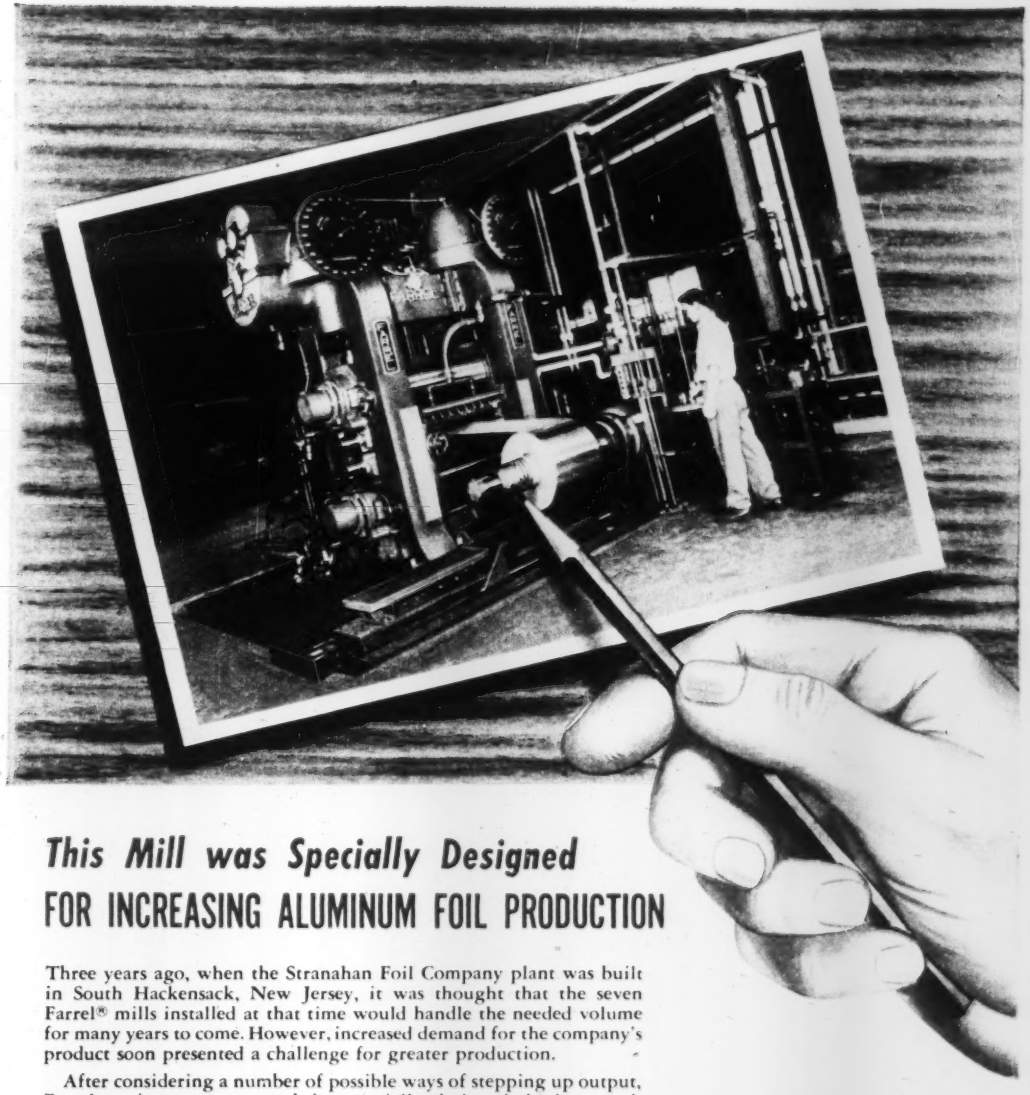
W. Fahlbusch Jr.
M. W. Kellogg Co.
Jersey City, N. J.

● *Write to Office of Technical Services, U. S. Department of Commerce, Washington 25.—ED.*

A Pat on the Back

Many thanks for giving me a chance to read STEEL. The "New Products and Equipment" section and "The Market Outlook" are particularly interesting to me. Also, I would like to comment on the fine presentation of your forecasts given in capsule form.

Otto Jendresen
Chief Engineer
Parker Pen Co.
Janesville, Wis.



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The new mill has 9" x 46" work rolls and 21" diameter backup rolls. All four rolls are forged tool steel, precision ground and crowned to meet requirements. A double motor screwdown provides for precise adjustment of either roll end independently or the simultaneous adjustment of both. The speed of mill operation can be varied to meet a wide range of production requirements by means of an adjustable voltage control system.

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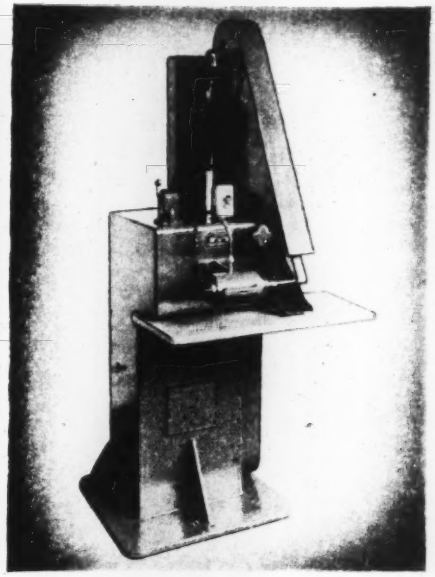
Jet blade polishing with

Behr-Manning abrasive belts

points the way to big advances in all production contour polishing



Off-hand machine uses belts as narrow as 5/8 inch, on a wheel small enough to do fillet areas. Manufactured by Vonnegut Corporation.

■ **Behr-Manning abrasive belts are helping to clear up a bottleneck in jet engine production, in the polishing of blades and buckets.**

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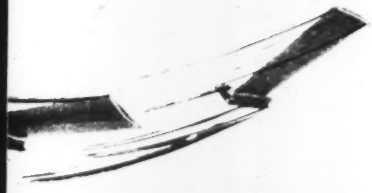
Several of the various ingenious methods already in use for this special contour belt polishing job are illustrated here. It is more than likely that some if not all of the new equipment may be adaptable to many other forms of contour polishing, and thus open an entirely new production field in contour work. BEHR-MANNING Field Engineers are well abreast of these new developments and will be glad to discuss them as applied to your work.



FOR IMMEDIATE INFORMATION

Read "Coated Abrasives Ease Jet Blade Finishing Problems" from the June issue of "Steel." The reprint will be mailed at your request. Write Behr-Manning Corp., Troy, N. Y., Dept. S-9.

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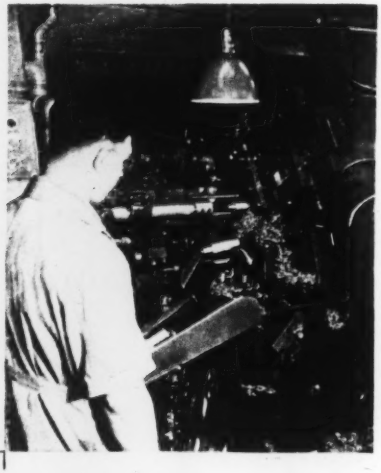

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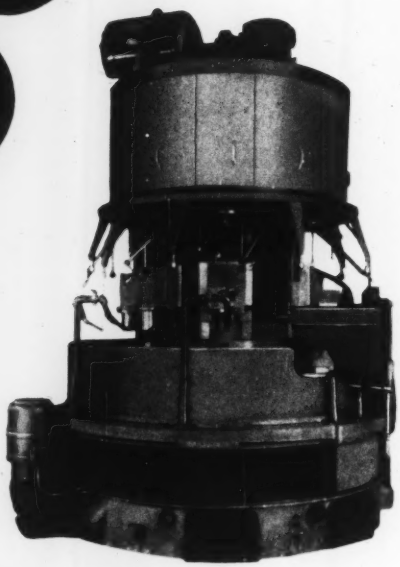

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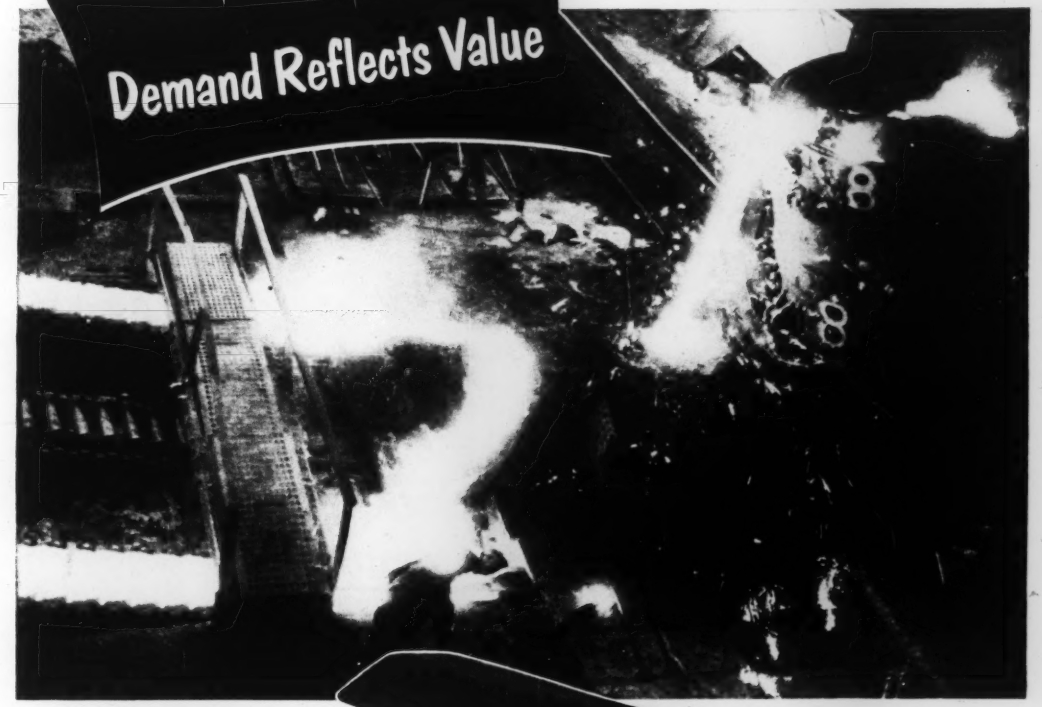

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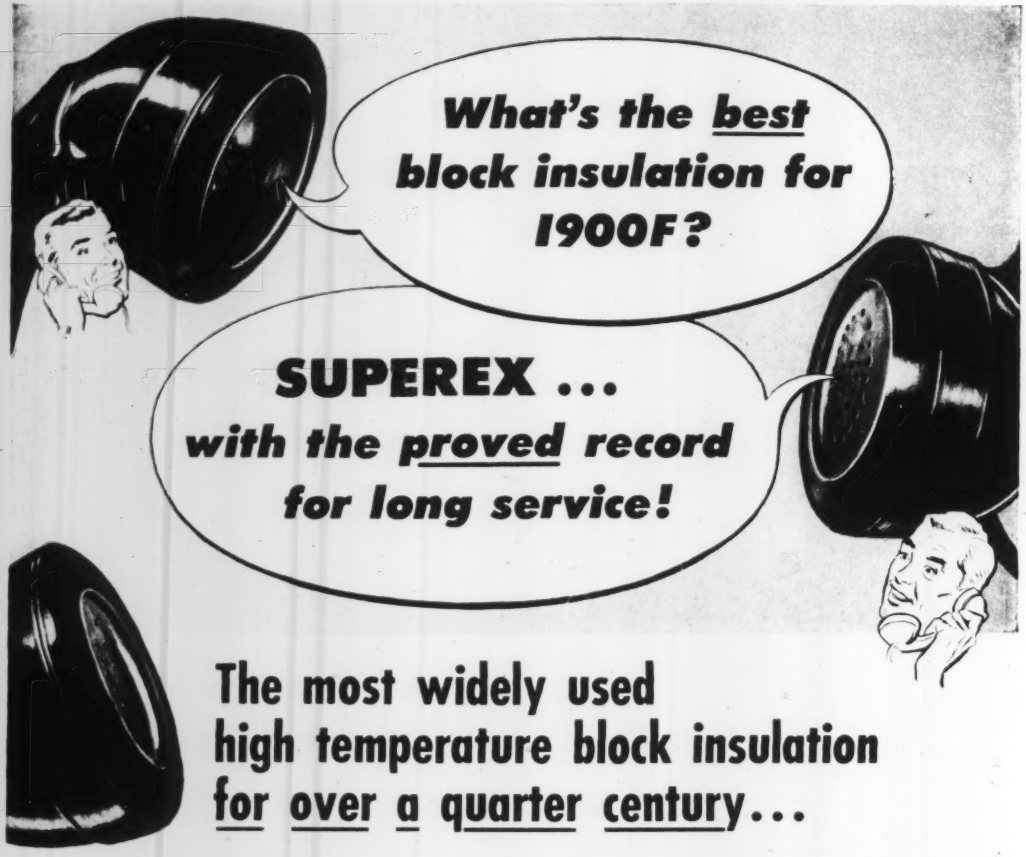

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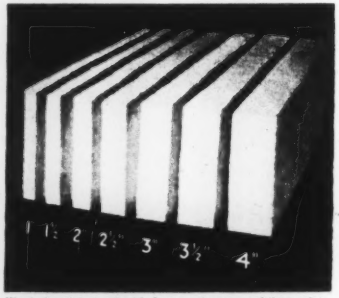
Long, efficient service life—Superex maintains high insulating value indefinitely—will not disintegrate in the service for which it is recommended.

Fast, easy application—Superex may be cut with an ordinary knife or saw for fitting around openings or to irregular surfaces. Because of its light weight and convenient sizes, Superex assures fast and economical installations.

For complete information about Superex block insulation, write for Brochure IN-134A. Address Johns-Manville, Box 60, New York 16, N. Y. In Canada, write 199 Bay Street, Toronto 1, Ontario.



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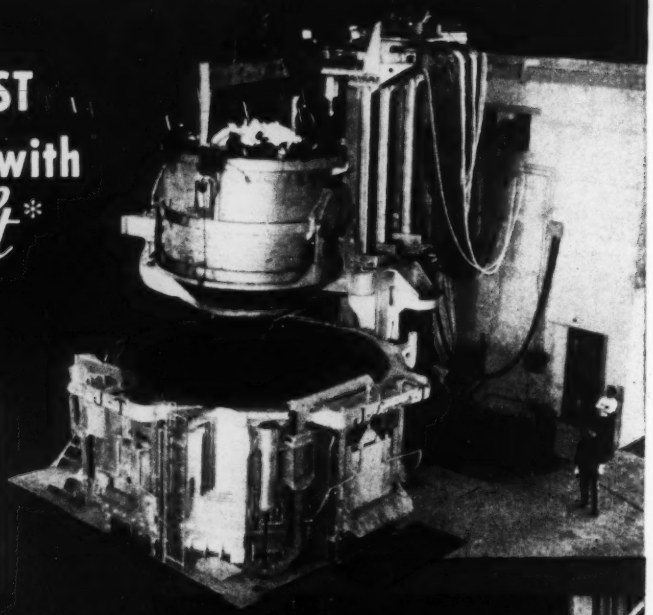
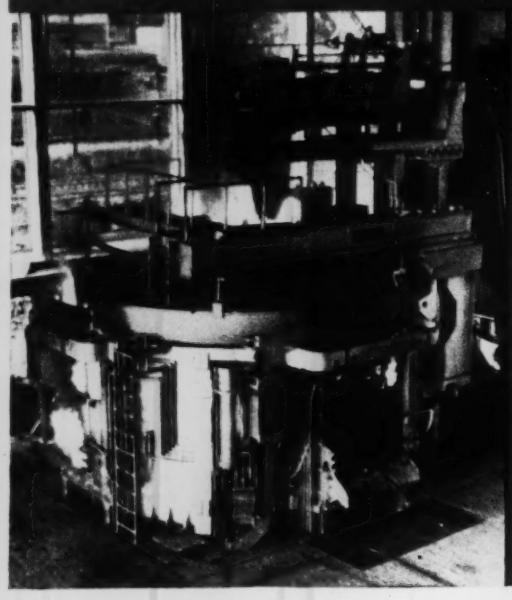
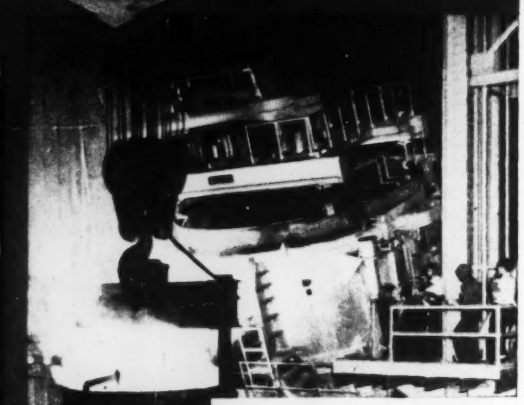


Right: Labor-saving top charging lets a Lectromelt Furnace get to work *fast*.

Below: With a Lectromelt Furnace, you can crowd on the power while holding close control on quality.





Lectromelt's hydraulic tilting mechanism provides positive, easily controlled, trouble-free operation. For Catalog No. 8 giving more details, write Pittsburgh Lectromelt Furnace Corporation, 323 32nd Street, Pittsburgh 30, Pa.

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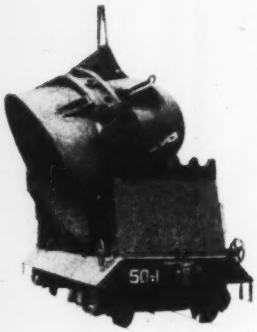
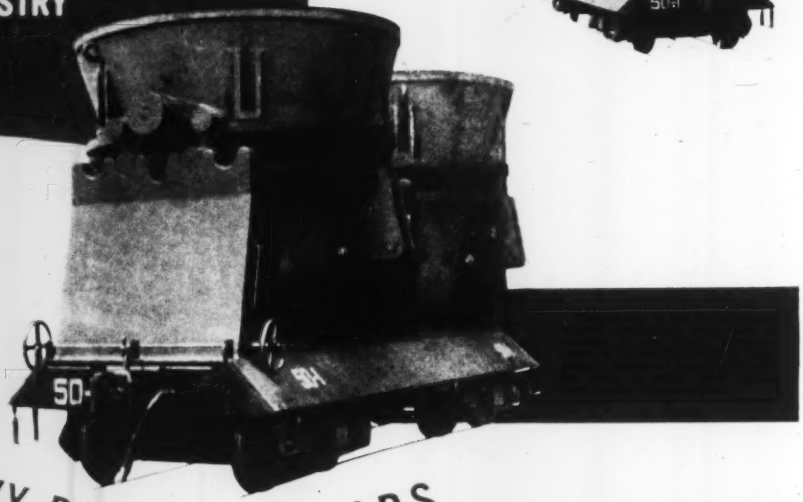
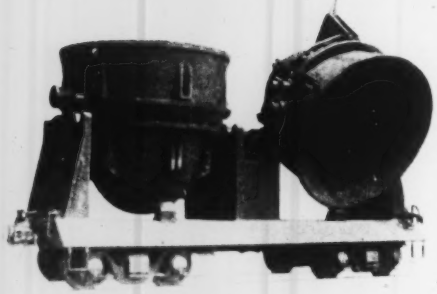




HEAVY DUTY SLAG CARS ESPECIALLY DESIGNED FOR TODAY'S OPEN HEARTH OPERATION



● Note the heavier construction used in every detail of this double-pot, crane-dumped car. This extreme ruggedness is a necessity to assure longer life and trouble-free service under present-day big-tonnage production.

In addition to the more sturdy construction, design features contribute to open hearth operational advantages. The unit is unusually compact and permits use with minimum allowances for space clearances. Simplicity of structure reduces maintenance time and retards deterioration. Cradle arrangement permits easier, faster dumping from either side.

Each pot holds 400 cubic feet which provides 800 cubic feet slag disposal capacity within 29'0" coupler to coupler.

Most new open hearth plants have Pollock hot metal and slag handling equipment because Pollock engineering is geared to mesh with overall efficiency planning. Also for open hearth ladles, ingot cars and charging box cars, consult Pollock before you invest.

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Raco Reel for 150-200# coils with floor mounting stand.

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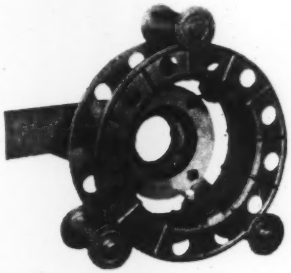

Raco Reel for 25#-50#-75# coils. Mounted on popular submerged arc machine.

The Reid-Avery reels are available with stands for floor mounting or with special spiders for direct attachment to most popular automatic welding machines. Three reels 12" ID x 4" wide, 14" ID x 6" wide, and 25" ID x 4" wide nominal size are in stock for prompt delivery.

Raco Reel shown split for loading.

Note the simple split reel construction with suitcase type latches. Coils can be replaced in seconds and no wrenches or special tools are required.

We are equipped to supply all sizes of layer wound coils for these reels.

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Heat-Treating of gears is a science. It can bring out the ultimate of service life offered by quality alloys. Good heat-treating is dependent upon knowledge of heat-treating processes and skill in using fine heat-treating equipment.

• Illustrated above is part of BRAD FOOTE'S new $500,000 heat-treating department with modern equipment that removes the element of chance from a sometimes fallible job. Precise control equipment assures exact temperatures and timing—which means unvarying conformity to hardness specifications.

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ELECTROMET *Data Sheet*

A Digest of the Production, Properties, and Uses of Steels and Other Metals

Published by Electro Metallurgical Company, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. • In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario

How Ladle Inoculants Reduce Chill . . . Produce High-Strength, Machinable Iron

One of the most significant developments in the field of cast iron metallurgy during recent years has been the widespread growth of the process of "inoculation" in producing quality metal to strict specifications. Inoculation has been defined as "a process in which an addition is made to molten cast iron for the purpose of altering or modifying the macro-structure of the iron and thereby improving the mechanical and physical properties to a degree not explainable on the basis of the change in composition."

Various ladle addition alloys are used for inoculation of cast iron, but there is a wide range in the efficiency and potency of these materials. The 50 per cent and 75 per cent ferrosilicons are mild inoculants, but they are used as ladle additions principally as a means of adjusting the silicon content of cast iron. The 85 per cent and 90 per cent grades of ferrosilicon are much more effective inoculants. Inoculating power is further improved through the use of special inoculating alloys, such as silicon-manganese-zirconium ("SMZ" alloy) and calcium-silicon.

ELECTROMET produces a number of alloys for inoculation, each of which has specific applications. The graphitizing inoculants are:

"SMZ" Alloy	60-65% silicon 5-7% manganese 5-7% zirconium
Calcium-Silicon	30-33% calcium 60-65% silicon
90% Ferrosilicon	92-95% silicon
85% Ferrosilicon	83-88% silicon
Special Graphitizer	A mixture of ferrosilicon and graphite for special uses.
75% Ferrosilicon	73-78% silicon
50% Ferrosilicon	47-51% silicon

These inoculants are usually added to the molten iron as it leaves the cupola spout, or during transfer from one ladle to another.

"SMZ" Alloy—An Efficient Inoculant

The benefits of inoculation are obtained largely as the result of rigid control of the structure of the graphite phase of cast iron which has received this treatment. The results of inoculation on the properties of a typical cast iron are demonstrated by the accompanying illustrations showing the effect of adding various amounts of "SMZ" alloy.

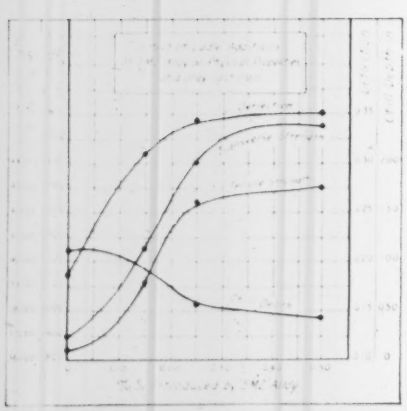


Fig. 1—These curves show how additions of "SMZ" alloy reduce depth of chill and improve mechanical properties when added to a series of irons selected to give the following final analysis: 3.10 total carbon, 0.80 combined carbon, 1.80 silicon, and 0.50 manganese.

Effects of Inoculation

The effects of graphitizing inoculants are: a drastic decrease in the chilling tendency of a given iron, a mild decrease in Brinell hardness, lowering of the section sensitivity of the metal, a definite increase in tensile strength, and an increase in transverse strength and deflection. These benefits are usually accompanied by improved fluidity, better castability, and improved resistance to wear.

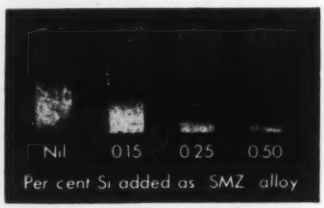


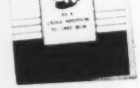
Fig. 2—These chill blocks show how progressive additions of "SMZ" alloy reduce the depth of chill.

New Stabilizing Inoculant

For the production of cast iron, ELECTROMET developed recently a special low carbon foundry ferrochrome. This silicon-chromium alloy is so balanced in composition that it increases the strength and hardness of gray iron, without increasing chill. The new alloy has a nominal analysis of 30 per cent silicon and 50 per cent chromium. It has excellent solubility in iron, and the inoculating effect of the silicon content makes it possible to add up to 1 per cent chromium to gray iron as a ladle addition, with no appreciable increase in chill. Castings treated with the new alloy have an excellent balance between machinability and good resistance to wear.

Booklets Available

Further information about ladle inoculants is given in the booklets, "SMZ Alloy and Its Uses as a Ladle Addition to Cast Iron" and "Silicon-Chromium Alloy in Complicated Iron Castings." You may obtain copies, free of charge, by writing or phoning to the address given above or to the nearest ELECTROMET office in Birmingham, Chicago, Cleveland, Detroit, Los Angeles, New York, Pittsburgh, or San Francisco. In Canada: Welland, Ontario.



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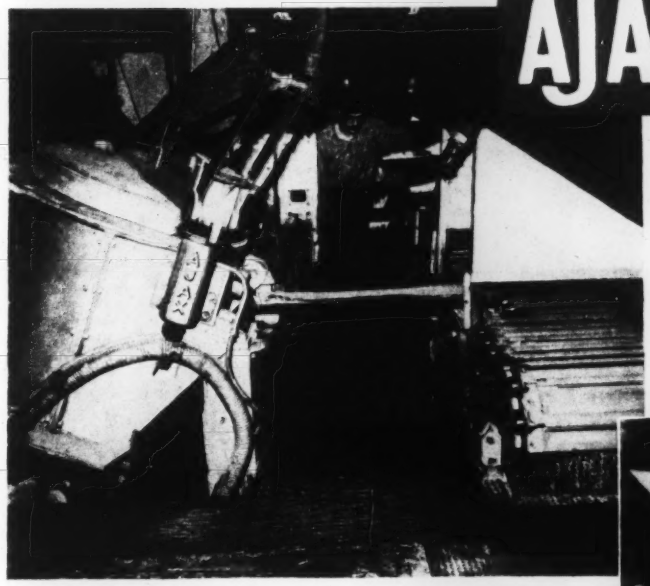
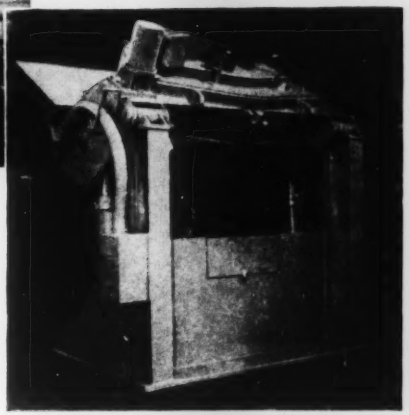


166 kW AJAX Induction Furnace in tilted position, pouring molten aluminum alloy through a coated trough into ingot molds on conveyor.

MAJOR AUTO MANUFACTURER RECOVERS SCRAP FROM MACHINING OPERATION BY MODERN MELTING PROCESS



Above is a 330 kW furnace. AJAX Engineering Corporation manufactures low frequency electric induction furnaces in a great variety of sizes ranging from 20 to 1000 kW. This type of equipment has been adapted to the full range of non-ferrous metals and alloys.

Here is an interesting setup for reclaiming aluminum alloy chips, which is installed adjacent to the piston casting setup in one of the largest automobile manufacturing plants in the country. More than half of the aluminum needed for pistons in this plant comes from this scrap recovery program. A considerable net profit is realized, and aluminum purchases are lowered.

Send for Reprint of Article on Scrap Recovery by Induction Furnaces

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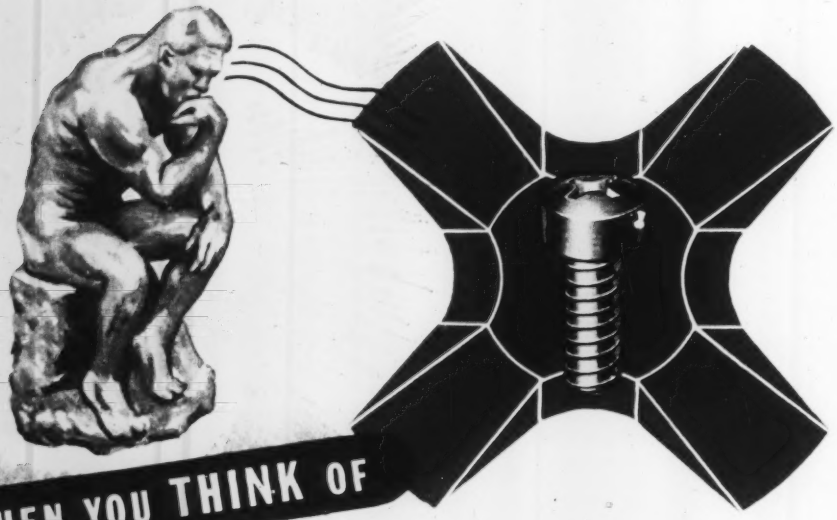

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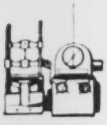

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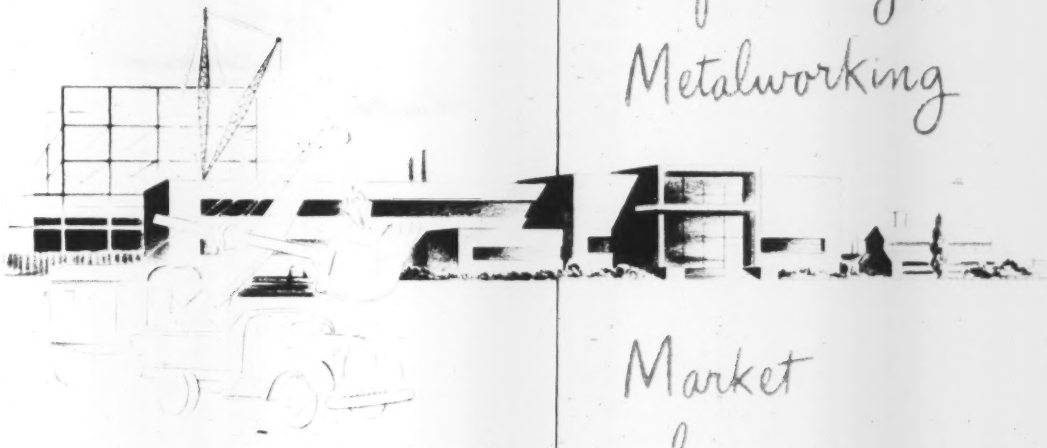

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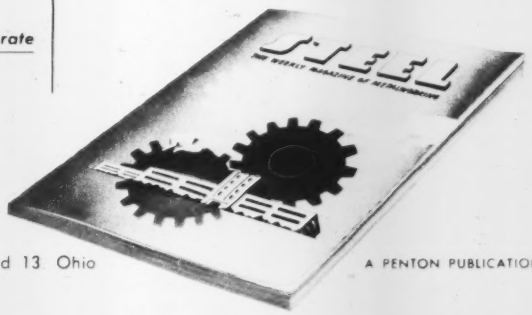

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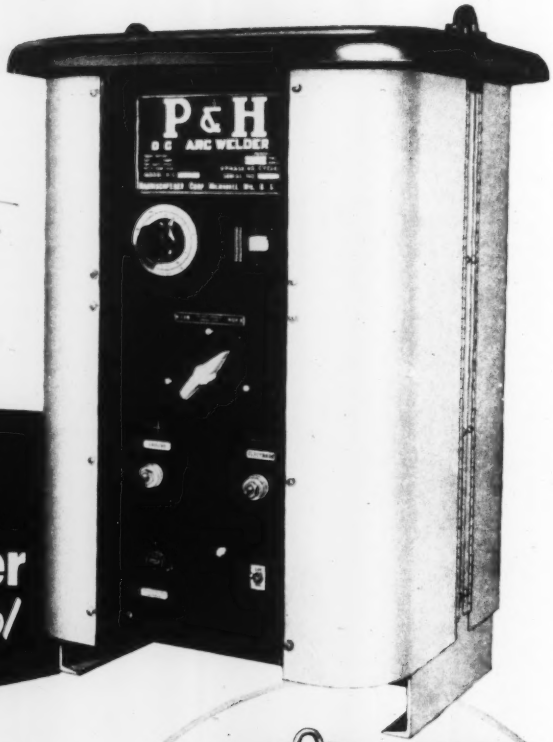

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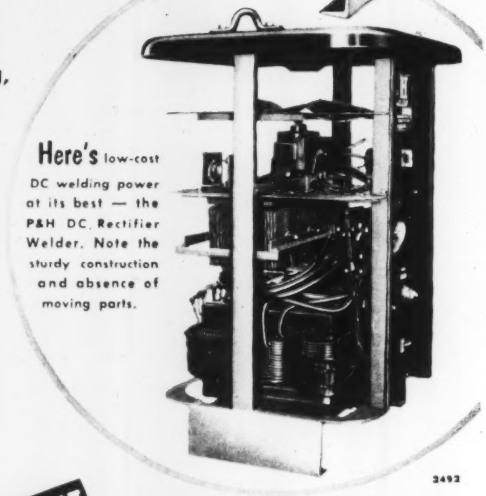

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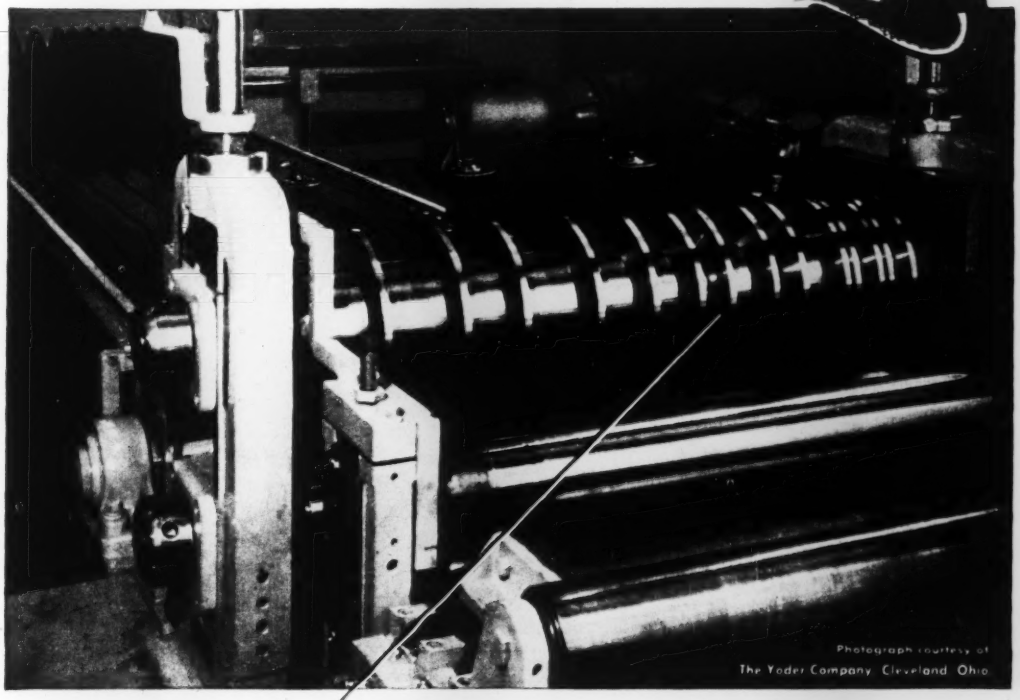

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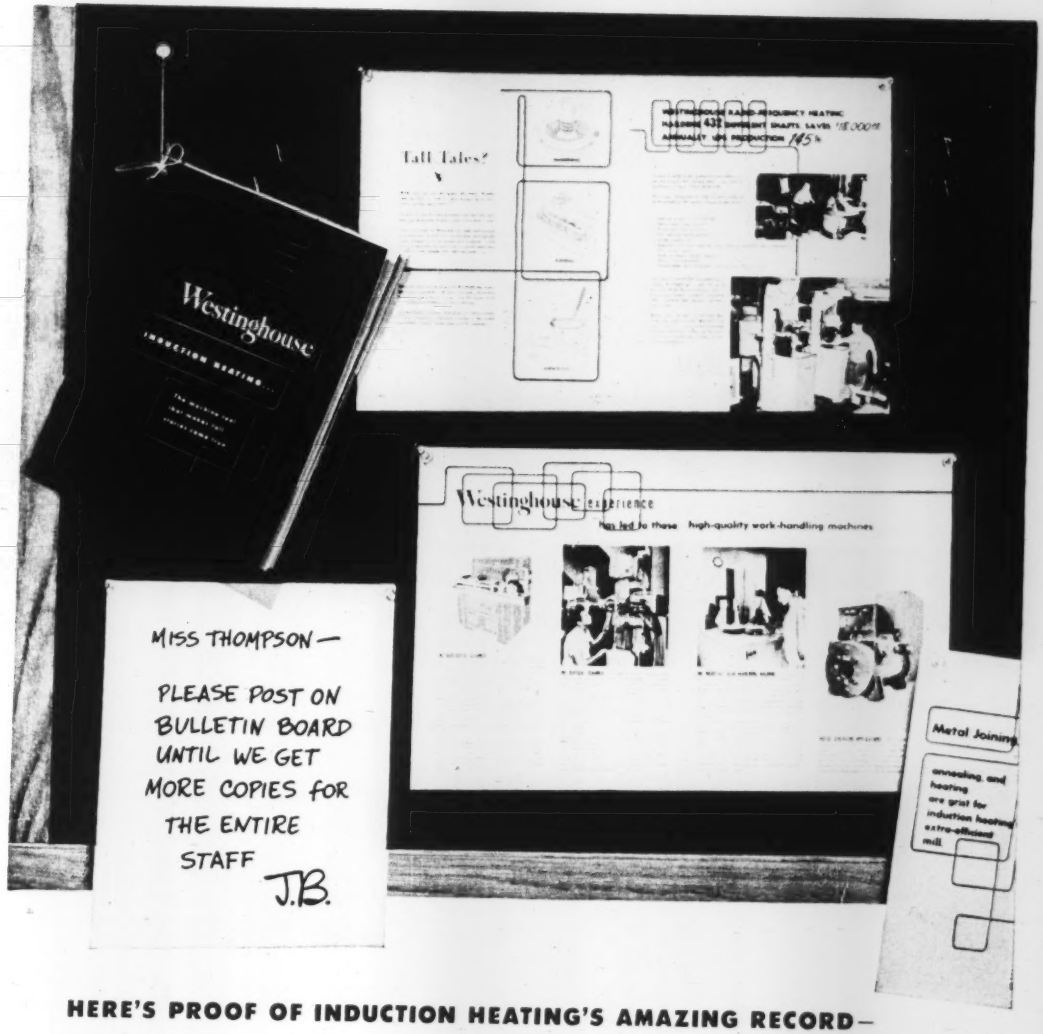

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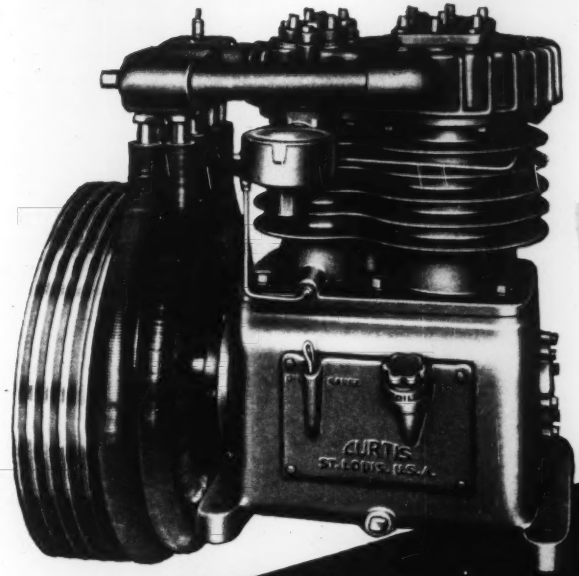

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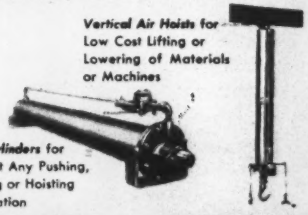

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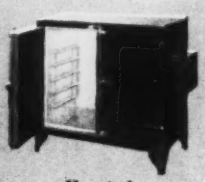

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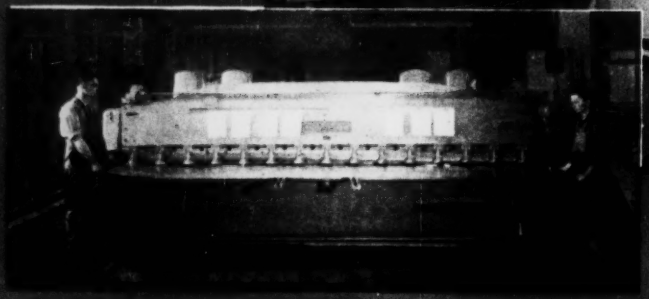

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Cincinnati Shears cut blanks accurately and to size for this equipment. Gauging must be rapid as well as accurate to handle the many different sizes required and keep production costs low.

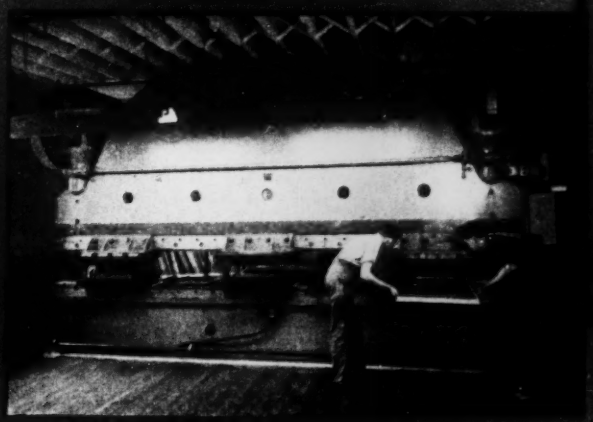
ACCURATE FORMING

Cincinnati Press Brakes form these blanks into accurate parts that fit correctly and insure outstanding quality in the finished products as well as maintaining low assembly costs.

You, too, can expect true blanks and accurately formed parts from this profitable team of Cincinnati Shears and Cincinnati Press Brakes.

Write for Catalogs S-6 and B-3, illustrating and describing these machines.

A row of Cincinnati All-Steel Press Brakes used in the production of these quality products



A 130 x 14′ Cincinnati All-Steel Press Brake 14′ 6″ between housings tooled for multiple operations

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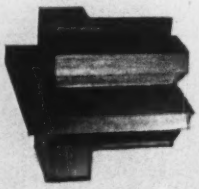
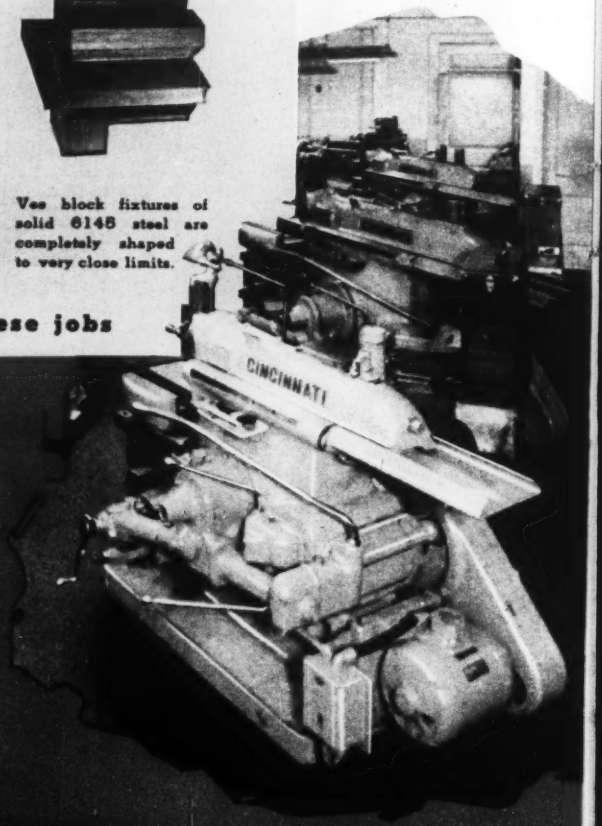
Slots, angles and compound angles are shaped to 0.001" limits on these solid 3140 forged steel tool holders.

Special index heads have slots accurate in shape, size, spacing and angularity to 0.001" on all dimensions.



Vee block fixtures of solid 6145 steel are completely shaped to very close limits.

Cincinnati Shapers do these jobs



The Jordan Specialty Company . . . Shaping Specialists . . . use Cincinnati Shapers exclusively. Outstanding accuracy and versatility in production are obtained in connection with low machine investment and low tooling costs. Due to the great variety of work produced, changes from part to part must be done with minimum loss of time. Here, Cincinnati Shapers give an exceedingly profitable and outstandingly accurate performance.

Write for Shaper Catalog No. N-5 covering the complete Cincinnati line.

Photograph courtesy Jordan Specialty Company, Detroit, Michigan

CINCINNATI

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STEEL

The Metalworking Outlook

September 1, 1952

More Steel Behind Iron Curtain?

Germans escaping from behind the Iron Curtain claim the Russians are building up steel capacity faster than anyone in the Western World realizes. Until lately Washington has pooh-poohed the reports, but now it's taking them more seriously because of the increasing number of such accounts. As of the first of this year, STEEL estimated the U.S.S.R. production at 33.4 million tons of steel ingots and castings. Too low?

Decontrol: By Next Spring

Evidence is piling up to support the prediction made here last week that the end of CMP may come in the second quarter of next year. NPA has just promised builders it will relax substantially its construction curbs by Apr. 1, 1953, and possibly earlier. Aluminum and copper supplies now are sufficient to meet all important needs of both defense and civilian production, DPA last week admitted. DPA Chief Henry H. Fowler even says manufacturers should be able to get all the copper they want by the second quarter. Steel is still a problem, but the recovery from the strike is going well.

No Great Change for OPS

Don't look for much change in the way OPS is managed under the new administrator, Tighe E. Woods, former rent controller. He is an administration wheelhorse who is not expected to have much to do with top-level thinking about price controls. As made clear by parting comments of retiring OPS Boss Ellis Arnall, the man who makes the final price decisions is Acting Defense Mobilizer John R. Steelman.

FTC Tries a Split

Federal Trade Commission may be considering further de-emphasis on enforcement of the Robinson-Patman Act. It has just split its Division of Economics into two rather peculiar divisions: Economic Evidence and Economic Reports. If the commission expected to increase its prosecutions under Robinson-Patman, it would more logically strengthen and consolidate the important Division of Economics, rather than cut it in two.

Expansions: Half Done

Of all the major expansion programs, the steel industry's is the furthest along. The objective was to boost capacity from 99.4 million tons of ingots annually in 1950 to 123 million by 1954. New capacity of about 12.6 million tons has already been added, leaving less than 50 per cent still to be completed. The goal in aluminum is an annual supply of 1,540,000 tons by 1955, compared with 720,000 tons in 1950. About 310,000 tons of new capacity has been added, leaving about 60 per cent of the program still to go. In electric power, the goal is 107 million kilowatts of capacity by 1955, as against 60.7

Production Engineering News p. 81 The Market Outlook p. 129

million in 1950. Capacity of about 19 million kilowatts has been added, leaving more than half of the expansion to be completed.

Hunt for No. 4

A factor delaying aluminum expansion is the government's desire to get a fourth private producer into the industry. There are few candidates that want to take a flier or that are considered eligible by the government. Olin Industries Inc. at the moment is about the only company that qualifies on both grounds.

New Deal for Kaiser-Frazer?

Henry J. Kaiser Co., which holds 9.5 per cent of the common stock in Kaiser-Frazer Corp., is getting set to do something about that problem child. Kaiser has just borrowed $22 million from a group of banks under terms which allow it to invest up to $25 million in K-F. That added capital may be used as an inducement for consolidation of K-F with another—and more profitable—business. Just what company would join with K-F is still subject to rumors; it could be some appliance maker.

Not Enough Green Stuff

Homestead, Pa., workers of U.S. Steel Co. have already found something in the strike settlement they won't like. It's their payday. Before the new contract was signed, they were paid in cash. The new agreement calls for payment by check, and the workers are having trouble converting them to cash. Stores and taverns won't take them, and on the first payday the banks didn't have enough cash to cover them. The situation will undoubtedly improve, but until it does, Homestead steel men still aren't seeing much of that green stuff.

Straws in the Wind

NPA hopes to restore the 45-day steel inventory limits by Jan. 1 . . . A record total of 53,363,000 motor vehicles is expected to be registered in the U.S. by the end of 1952 . . . A new color TV system which will not make present receivers obsolete is foreseen by W. R. G. Baker, vice president of General Electric Co. and chairman of an industry group working to perfect the new color telecasting method . . . Metalworking plants in Bakersfield, Calif., were not damaged in the August earthquake that wrecked the shopping district of the city.

What Industry Is Doing

Labor leaders will try to keep strikes at a minimum in the next six months to soothe Congress and consolidate gains (p. 53) . . . You will probably see a decided trend toward better industrial relations within three or four years, says R. S. Livingstone, vice president-personnel, Thompson Products Inc., Cleveland (p. 55) . . . Labor organizers are eyeing more small and medium-sized companies (p. 57) . . . Machinery builders stew in new red tape, as OPS requires ceiling prices written on contracts, proposals and invoices (p. 58) . . . Makers of metal products can mark up prices by the full amounts of the increases on steel, copper and aluminum (p. 59) . . . German labor's fight to manage industry may prophesy long-term labor aims in the U.S. (p. 63) . . . Field warehousing brings working capital to companies with ample storage space (p. 64).

How else could this job be done

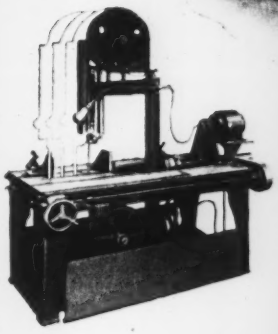
so easily, so accurately and so inexpensively?

Segmentation of 42" Steel Casting

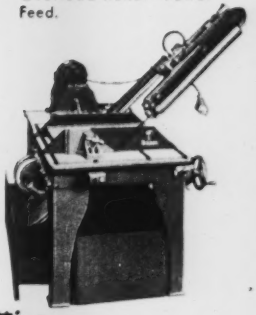
Every tool room, machine shop, die shop and maintenance department needs at least one No. 8 MARVEL Metal-cutting Band Saw for cutting off anything from ¼" drill rod to bars or billets of 18" x 18" cross-section . . . for roughing large work to size and shape, thereby saving hours of machining . . . for those occasional "trick" jobs, impossible on any other saw, that bob up in every plant.

Odd shapes that can't be held in the removable, quick-action vise, are easily set-up on the No. 8's large, T-slotted work table. MARVEL Overload-Relief Power Feed insures accurate cuts under the most adverse conditions because blade pressures are automatically held within limits which are pre-set instantly for each job. The blade is never forced beyond its capacity to efficiently and accurately remove metal . . .

Close limits are further assured through the work being clamped rigidly to the bed of the saw and the blade power-fed through it instead of pushing the work through the blade. This is also true in miter cutting, as the blade column—*not the work*—is swung to the required angle. The handiest, most versatile machine tool, it is also the busiest in most shops.



This double exposure illustrates how the blade maintains its vertical position while moving into and through the work, impelled by the automatic MARVEL Overload-Relief Power Feed.



Column set at angle to cut 45° miter on 18" beam. Entire saw column can be swung to cut at any angle from vertical to 45° right or 45° left.

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"TWINS?" No!

Yet buyers and sellers alike often think of them as "twins." That is risky. In most cases you can safely substitute strip for sheet—size for size. The reverse, however, can lead to costly disappointments in fabrication and service.

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**"SH-RIP"—a new steel word coined by us—describes sheet steel that happens to be cut into strip widths, in coils or otherwise. Ask any Reliance man to explain why the difference between strip and "SH-RIP" can matter to you.*

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A Question of Power

Labor Day, 1952, has certain distinctions. It is the 70th first Monday in September on which labor union members have observed the day as something special. A few weeks ago, on Aug. 9, a memorial was unveiled in Arlington cemetery at Merchantville, N. J., to the memory of Peter J. McGuire, who at a meeting of the Central Labor Union of New York on May 8, 1882, proposed for the first time that the first Monday of September be observed as a "demonstration of fraternity and the harbinger of a better age—a more chivalrous time, when labor shall be honored and well rewarded."

In response, the Knights of Labor on the first Monday of September in 1882 paraded in New York. They repeated in succeeding years and gradually observation of the day spread to other sections. The movement gained such momentum that on June 28, 1894, Congress passed a bill making Labor Day a legal holiday.

Unionism experienced ups and downs from the turn of the century until 1933. In that year a government administration came into power with the financial aid of a rich union. From that date forward, every bit of influence the administration could exert was made available to favored union leaders. It is noteworthy that in spite of this priceless support, the number of union members has not kept pace with the growth of gainfully employed persons.

Partly because of this seeming inability of unionism to progress satisfactorily on its own merits, we witness on Labor Day, 1952, a situation in which unions—more powerful than any other minority in the country—feverishly are seeking still more power. We also witness an administration that is bending every effort to help unionism to become more powerful.

Today as the thoughts of Americans turn to the significance of Labor Day, many will congratulate unionists on the progress they have made. At the same time—as true friends of a constructive union movement—they will wonder seriously if it will not be wiser for union leaders to concentrate on utilizing to better advantage the power they already possess than to strive now for additional power.

E. L. Shaner

EDITOR-IN-CHIEF

THREE FUNDAMENTALS: Asked what basic principles of modern industrial relations are of primary importance, R. S. Livingstone, notably successful vice president in charge of personnel of Thompson Products Inc., named three (p. 55): Follow the golden rule. Recognize the American workman as the great fellow that he really is. Remember that every

employee has hopes and aspirations and wants to get some place.

Most personnel experts will agree that these are fundamental. The trouble is that some chief executives have been slow to accept these truths. Mr. Livingstone is quite right in stating that the greatest weakness of management is the tendency to think in terms of the status quo and the unwillingness to pass along to employees the genuine hopes that all of us hold for a greater and brighter America.

* * *

EXPORTS LIMIT WAGES: According to figures in the United Nations' Statistical Yearbook (p. 63) hourly wage earnings in manufacturing in 1951 and early 1952 were $1.65 in the United States, 58 cents in France, 44 cents in the United Kingdom, 35 cents in Germany and 30 cents in Italy. Of course many factors account for the disparities in these averages, but there is one which, while extremely important in European countries, seldom is given a thought in the United States.

That factor is the influence of wage scales upon exports. In the United States exports account for less than 10 per cent of national income. Consequently the influence of domestic wages on export volume, with a few exceptions, is minor. In France 20 to 28 per cent of national income is derived from exports, in Great Britain 34 to 45 per cent and in Belgium 65 to 69 per cent. It is easy to understand why the threat of pricing one's product out of world markets is a constant deterrent against excessive demands for wage increases in these countries.

* * *

TAX MIRACLE UNLIKELY: In October, 1932, the annual meeting of the American Institute of Steel Construction was held in the Schenley Hotel in Pittsburgh. On the last day of the convention a few members of the institute walked over to Forbes Field to listen to Candidate Franklin D. Roosevelt's campaign speech. They heard him promise that if elected President he would reduce government expenses by 25 per cent.

Today Candidates Dwight Eisenhower and Adlai Stevenson are promising reductions in federal expenditures — undoubtedly with the same sincere motives which prompted FDR to make a similar promise. The cold fact is that no newly elected President can do much to alter expenditures in the early stages of his administration. It takes time to reverse a trend as strong as that of current spending.

Therefore businessmen should expect no tax miracle in 1953. There could be some slight improvement in the volume and distribution of the tax load, but real progress will be slow.

* * *

BRISK AUTUMN AHEAD: Labor Day always is heralded as a dividing point which stands between a normal summer let-down because of vacations and a brisk fall pick-up. This year the contrast between the two periods will be sharper than usual. The steel strike contributed to an abnormally low level of summer activity and the zeal to make up for lost time promises to step up the pace of business after Labor Day.

The last two weeks of August witnessed a remarkable recovery from the low point of the steel strike (p. 71), but as a whole, industry did not completely restore activity to pre-strike levels. Barring new crippling work stoppages, those levels should be attained and exceeded in September or November.

* * *

BRAZING IS THE KEY: Successful furnace brazing of component aluminum castings may make it possible to produce complicated castings from assemblies of simple cast units.

Already Cleveland Development Division of Aluminum Co. of America (p. 88) is employing this method in the production of aluminum engine blocks. Only three unit castings are required. One is the front end, one the rear end and the third is a middle section. When placed together the two end sections form a four-cylinder engine block. A six-cylinder block calls for the two end sections with a middle section sandwiched between them. Insertion of another middle section provides for an eight-cylinder block.

Key to the process is a gasket-like piece of fluxed brazing alloy which is placed between each section. This material melts at a lower temperature than does the parent metal. Heated under close furnace control, the components are brazed together so effectively that in fatigue tests failure occurs much more often in the parent metal than in the brazed joint.

Ingenious Ways of Getting Steel

Steel continues in short supply from causes well known to all.

However, business must go on, and our customers, with the close cooperation of Ryerson engineers and metallurgists, are performing near miracles in order to keep the wheels of industry turning.

Leaner alloys are being heat treated and used where it was never believed they could possibly serve. Available chrome stainless is doing some jobs better than the restricted nickel chrome formerly used.

When large rounds are not in stock we are furnishing forgings, which are stronger and quite satisfactory.

Hot rolled bars are being machined when cold rolled bars are unavailable, and cold rolled bars are being used where only hot rolled bars were used before.

Heavier and larger welded tubing is replacing hard-to-get seamless, and available square welded tubing is being used in structural applications formerly requiring angles, channels or beams.

To meet one customer's rush order for 18" plate circles, we secured the left-over center pieces from a second customer who was cutting 20" plate rings. And on another recent occasion we furnished T's not otherwise available by splitting a number of I beams.

Sheet metal users are providing us with drawings showing the exact size and shape of the various pieces of sheets they require. We're cutting these requirements—sometimes by the thousands—from other small or odd shaped pieces, thus permitting the customer to continue in production.

On other products we are asking for the exact size and length needed so we can fill orders from shorts even though we're not able to furnish the steel from our regular stocks.

In addition we have operated a steel and machinery exchange in the Ryerson Pictorial to expand the available supply and now are receiving lists of material from customers and passing them on to others through our sales representatives.

These are only a few of the many ways in which we are helping steel users meet their requirements.

Obviously, we are not always able to come through, but we invite you to call on Ryerson experience and facilities when you need steel. We will always do our best and sometimes the results may surprise you.

* * *

While at the moment a portion of certain products must be reserved for defense purposes, the strike is over and our inventories are being replenished. We hope that before many months we may be able to furnish all the steel you need.

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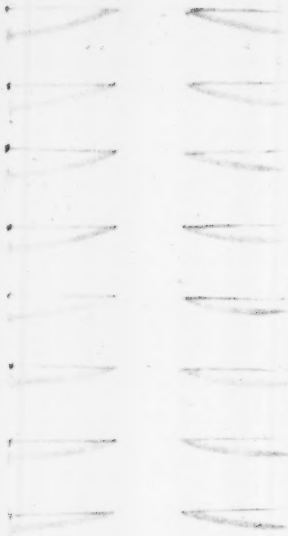

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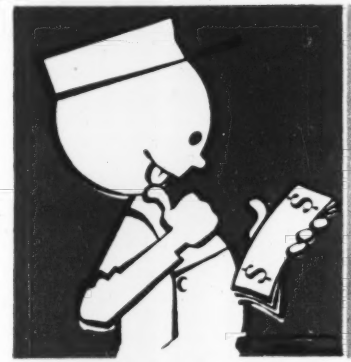


AVERAGE HOURLY EARNINGS

	1939	1939 Adjusted[2]	Current Rates
STEEL (Blast Furnace, Steel works, & Rolling Mills)	$.845	$1.61	$2.04[1]
COAL	.784	1.50	2.23
AUTOMOTIVE	.929	1.78	2.03[1]
ELECTRICAL MACHINERY	.702	1.34	1.69
RAILROAD EQUIPMENT	.762	1.46	1.89
AIRCRAFT	.745	1.43	1.72

Source: U. S. Department of Labor, Bureau of Labor Statistics.

1. Adjusted for recent wage increases. Steel industry hourly wage figures as computed by American Iron & Steel Institute are usually higher than those of the Bureau of Labor Statistics. For example: February, 1952, figures are—AISI: $1.94; BLS: $1.885. The $2.04 noted above for the steel industry is based on BLS figures.

2. Adjusted to June, 1952, Consumer Price Index.

LABOR ROUND-UP

Labor Wants Peace—for a While

The CIO and AFL, at least, will try to keep strikes to a minimum for the next six months or so, in order to soothe Congress, consolidate gains and plan for 1953-1955

THE CIO AND AFL have long-term objectives that should mean relative labor peace by their affiliates for the next six months, but possibly more fireworks than ever one to three years from now.

The current policy of those groups' leaders is: Be as quiet on the industrial front as possible for a while. Here's why they want peace: In the first six months of this year, American workers lost 30.7 million man-days due to strikes, 28.7 per cent more than the 23.9 million lost in all of 1951.

No National Strikes—So, neither the CIO nor the AFL wants any nationwide industry strike; they will frown on walkouts in single nationwide companies for a while because of the unfavorable publicity. Even the labor difficulties at Borg-Warner Corp. as of last week affected only eight of the corporation's 28 plants.

So certain are union leaders of the current unpopularity of strikes among workers that AFL's International Association of Machinists is emphasizing that it rarely strikes. That's in a contest with the CIO's UAW over who should represent employees of the Chrysler Detroit Tank Plant.

Politics, Politics, Politics — Although the two largest labor organizations won't always see eye to eye, enough agreement will exist between them in the next 60 days to speak in chorus as loudly as possible on the political front. If Adlai Stevenson wins in November, they'll spend the following four months or so repairing their political fences and trying to win the man from Illinois solidly to their side. Noisy strikes won't accomplish that aim.

If Dwight Eisenhower wins, they'll spend the following four months ingratiating themselves with the general and building new pipelines to Washington. Noisy strikes won't further that aim.

Matter of Money—But no union leaders can ever afford to ignore for long the economic side of labor activities. They'll spend the next six months consolidating winnings for their members. They'll use the steel gains as their goal and argue that this industry or that must catch up. A glance at the table will show where some of those demands are likely to come. "Operation catch-up" will develop on a company-by-company basis.

The "catching up" will be virtually automatic for an estimated 3000 steel fabricators, foundries and other companies whose wage scales historically parallel those in the steel industry. WSB Regulation 10 provides that regional boards may approve contracts where the tandem relationship is proved.

Matter of Membership—Another matter will also get a lot of attention by labor leaders in the next six months. They'll drive to increase membership (for a story on where those drives will come and what to do about them, see p. 57). The United Auto Workers alone spent $914,190 on recruiting in the fiscal year ended May 31 five times more than it spent in the previous 12 months. The result: A net gain of 134,595 members to bring the average membership to 1,180,284 for the year.

The UAW is making progress, but organized labor generally is not. An estimated 15 million workers belong to unions today. 24.6 per cent of the work force. That compares with an estimated 15.4 million union members in 1947, 25.6 per cent of the work force. Labor leaders are worried about the drop. Hence, many will follow UAW's example and make a concerted effort for more mem-

bers. The next six months will be an ideal time, from labor's standpoint.

Right To Manage—In the next six months, labor generally and the CIO particularly will also mend fences and otherwise prepare for another round in the long-term objective of winning more rights to manage companies where they represent workers. Europe has already gone far in this matter (see p. 63), and American union officials want to emulate the Old World methods. They eventually want membership on company boards of directors to have a voice in general business policies, but for the time-being they will fight to have the final say-so on incentive plans and similar matters.

That issue is on dead center now. Nearly all the big steel companies have just finished writing new contracts and few changes of significance turned up. The principal new approach to the matter is in the contract with Youngstown Sheet & Tube Co. which has the right to establish any system of incentives it considers fair and reasonable for a six-months period. At the end of that time, the entire program will be reviewed by company-union representatives.

Guaranteed Annual Wage—Labor generally and the CIO particularly in the next six months will take time out to refine ideas on another long-term objective, the guaranteed annual wage. The CIO's UAW is hot on this one.

A hint on when a full-scale battle on the issue will shape up lies in the expiration of major automotive contracts. That's not until 1955. Opening skirmishes may come earlier when other UAW contracts run out.

Matter of Discipline—Complete labor peace, even within the ranks of the CIO and AFL, will be impossible in the next half year. All-told, more than 200,000 labor contracts exist, the bulk of them with those two organizations. The impetuousness of local leaders and other local conditions will inevitably result in wildcat walkouts and isolated authorized stoppages among CIO and AFL units.

The right-wing and independent unions, notably the United Mine Workers, may call strikes. Ideological considerations may send out members of the independent and leftist unions such as the United Electricalworkers or the International Union of Mine, Mill & Smelter Workers. Odds now are about six-to-five that John L. Lewis will call out his miners the end of this month, or that he will at least continue a series of sporadic stoppages such as the "memorial" that ends today.

A salient factor which is complicating the situation with the UE is a jurisdictional fight with the CIO's entry in the electrical field, the IUE. That may bring stoppages as it did at Westinghouse Electrical Corp.'s Nuttall works. The two unions are virtually even in strength and the battle may go on for years. The smelters union has such a jurisdictional battle only in isolated instances. It has already signed up with Phelps-Dodge Corp.'s copper workers, so prospects are good that it will come to terms with other members of the industry.

Alarm—The CIO and AFL hope the independents stay in line. The two big unions are alarmed at the temper of public opinion, alarmed at the government's weakness in swinging a settlement strongly in favor of labor, as demonstrated during the steel case, and alarmed at what Congress might do about labor legislation in the next session ahead.

Most of CIO officials have long operated under the theory that the best way to win big gains is through government seizure or threat of seizure. The steel strike knocked a hole in that because it showed that the President with existing legislation has the power to seize under only limited circumstances as provided in the Selective Service Act. (The President can seize the railroads in time of war, but legally we are not at war with anybody.)

So labor for the short term wants to allay the public's alarm, work for a political victory in November and hope that such a victory or a clean strike slate for a few months will calm Congress and prevent it from enacting any anti-labor legislation. If it accomplishes those objectives, it can more easily go ahead with some of its more ambitious plans for 1953-1955.

Tarnished Brass

IN ITS "peace and good will" campaign, the UAW-CIO is embarrassed and uneasy about the continuing strike among Connecticut brass mills. Scovill Mfg. Co. is still the prime target for the union, which figures other companies will topple like houses of cards once settlement is reached with the big one.

The walkouts were first marked by violence among pickets, but that has since calmed down, largely on orders from Detroit which wants as little national publicity as possible.

Apprentice Deferrals Expanded

Apprentices in critical occupations hereafter, subject to decisions of local draft boards and the Defense Department, will be eligible for deferral after they have served a 6-month apprenticeship. Heretofore they required a full year's training to qualify.

Another change in the Labor Department's list of critical occupations is the deletion of ship riggers and ship layout men; they no longer are entitled to deferrals on the score of criticalness of occupations.

Founders Fear Molder Lay-Off

Steel founders fear that they will have to lay off molders early in the fourth quarter unless they get more realistic consideration under the Controlled Materials Plan.

At present they are in the same basket with rolled steel products; they have their third quarter allotments and 80 per cent advance allotments for fourth quarter, with no present prospect of receiving the remaining 20 per cent for fourth quarter.

Inasmuch as steel casting plants, unlike steel rolling mills, operated during the steel strike, they need their full allotments in order to maintain their production schedules. NPA is said to be reviewing this situation.

20 QUESTIONS: A Case Study in HUMAN ENGINEERING

Recorded and Edited Interview with
R. S. LIVINGSTONE
Thompson Products, Inc.

LABOR DAY, 1952, marking the fifteenth anniversary of industrial unionism's rise to power, may be an appropriate occasion to examine some of the facets of industry's relations with its employees—past, present and future.

To learn the thoughts and philosophy of a "human relations" executive who has been conspicuously successful since his start in the field 18 years ago, STEEL's editors interviewed Raymond S. Livingstone, vice president-personnel, Thompson Products Inc., Cleveland.

His answers to questions were recorded, transcribed and edited. They come from a man who has followed employee relations work from the ground up in a company which has become a leading manufacturer of automotive and aircraft parts, both original equipment and replacement products, and has seen its operations expand to cover 19 divisions in ten cities, employing close to 24,000 and likely to achieve a sales volume this year in excess of $250 million.

Mr. Livingstone was born in Pittsburgh, received his technical training at Case Institute of Technology, joined Thompson in 1929 and became director of personnel in 1934. He was named a vice president in 1942.

Q: Speaking as one of the Thompson Products management team, would you summarize your thoughts on today's industrial employee - management relations?

Well, I think that conditions are considerably better than the overall picture reported in the newspapers would lead you to believe. Here are some of the favorable aspects that haven't been commented upon to a sufficient degree: In the first place, there's great effort being made by industry to improve personnel practices and human relations with its employees. Top management is now genuinely interested for the first time. The word is spreading down within organizations to plant managers, to superintendents, to the supervisory organization, that good human relations are to be worked for and achieved. Conferences are being attended all over the United States where members of management are trying to learn more about the practice.

A second point is that workmen today are acquiring a much better understanding of economic matters, such as relationships between wages and prices, necessity for a company to earn a profit, etc. Old fallacies are being disproved. Men once more are coming to believe that in order to earn a good wage, a full day's pay, you have to do a full day's work. The importance of profit to job security and higher pay is becoming recognized, too.

A third positive development is the fact that the general public and workmen themselves are beginning to disapprove of strong-arm, arbitrary union tactics. They want to see a more constructive and a more thoughtful approach on the part of their union leaders in relationships with management. They're beginning to wonder for the first time whether the union movement isn't getting too powerful.

These are good, favorable developments; I think that within three, four or five years you're going to see a decided trend for the better in industrial relations.

Q: What do you consider the most important avenues of communication between management and employees?

The most important channel of communication is a supervisory organization that is fully informed by top management of the company's hopes and aspirations and

goals and developments, with this information being passed along by word of mouth from supervisors to the men in the plant.

In our organization we have two ways of getting this information to supervisors which are worth noting. First, we have regular weekly meetings of all our supervisory organizations. We have some 2,000 members of supervision and we pass down to them at these meetings every bit of business information that is of significance to top management.

A second way is through our weekly supervisory newsletter, a carefully and interestingly prepared summary distributed weekly which brings members of supervision up-to-date on what's going on in the company.

Q. What other publications do you circulate besides this supervisory newsletter?

We have our employee newspaper, *Friendly Forum*, which is published every four weeks. Each issue takes a complete inventory of every significant development that has taken place in the company since the last issue. It's a true newspaper. It has definite beats to cover and we emphasize business news because every employee wants to know the answer to questions like "How is the order situation? Am I going to have steady work? Are there new developments which bear on my security and possible opportunity?"

Q. Do you feel it is important to get company news to employees ahead of such sources as the plant grapevine or persons outside the company?

Yes, but it's pretty hard to beat the plant grapevine on big matters. We are not always successful in doing that, but we are always able to follow up the plant grapevine within a few hours with an authoritative bulletin or newsletter on any important subject. We are never scooped by outside sources, however. We have a rule in the company that Thompson people get the Thompson news first.

> ***"... American worker is a great fellow —individualist and optimist"***

Q. You put considerable emphasis on the phrases "Thompson Team" and "Tapco Team". Have they taken hold as far as employees are concerned?

Yes, I think most of our people are pleased to think that they belong to a *team*. That may seem a trite or inappropriate word but it really describes the spirit and relationship that we have within the company.

> ***"... build up personal contacts; get information to employees promptly"***

Q. How important are company-sponsored extracurricular activities like athletic events, picnics, dances and so forth?

They're very important. We like to have our plants be something more than just places to work. Discussion during the day of what took place the previous day in the shop baseball league, or a good-natured ribbing about a spare missed down at the bowling alley the night before, is a healthy thing. It brightens up the shop and leads to the friendship we try to build.

Furthermore activities such as the type we are talking about give employees with leadership an opportunity to express that talent constructively by serving as captains, as chairmen of committees,

Q. Do you see a danger in going too far along this social line?

Yes. A recreational and social activities program is certainly just an aid to a good human relations program. A company that thinks it can keep its people happy by playing baseball and going to dances is just silly. Activities are just corollary aids.

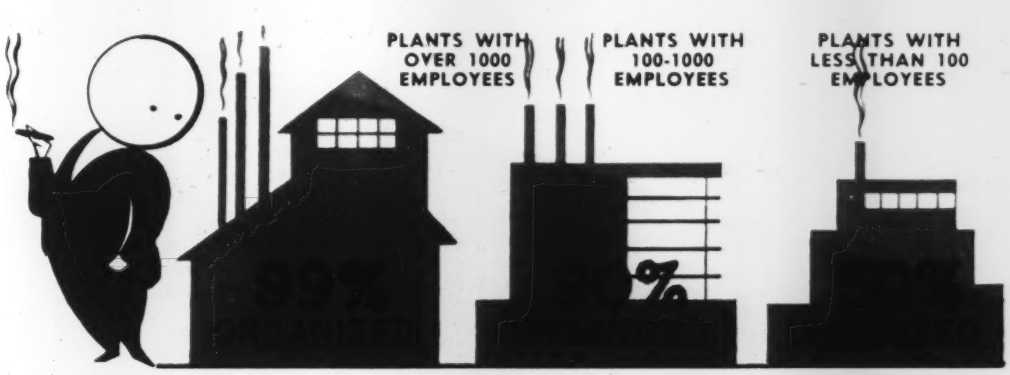
Q. Do you hold company open-houses regularly for employees' families? And how well attended are they?

Oh, yes. Once a year we endeavor to have an open house at all of our plants. It's a great occasion. Mother shows up with the kids and they are anxious to see where Dad works, and what he helps make. So Dad takes them through the plant and describes his job. They meet executives who previously were only names to them. They have an opportunity to shake hands with these officials and appraise them personally by looking at them eye-to-eye. We have entertainment in our cafeterias, food and light refreshments. It's a great day that makes all of us feel better afterward.

Q. Can you say how your industrial relations problems have changed as the company has grown and personnel has increased and more plants have been activated?

The problems are not substantially different. The principal difficulty is one of continuing to build personal contacts and in getting information promptly to employees. Naturally, as the company grows, the matter of distributing news effectively down through the organization increases, and you must be constantly strengthening points of communication. You also have the problem of obtaining reasonable

(*Please turn to Page* 98)



Labor Organizers Turn to Smaller Plants; Get Ready Now

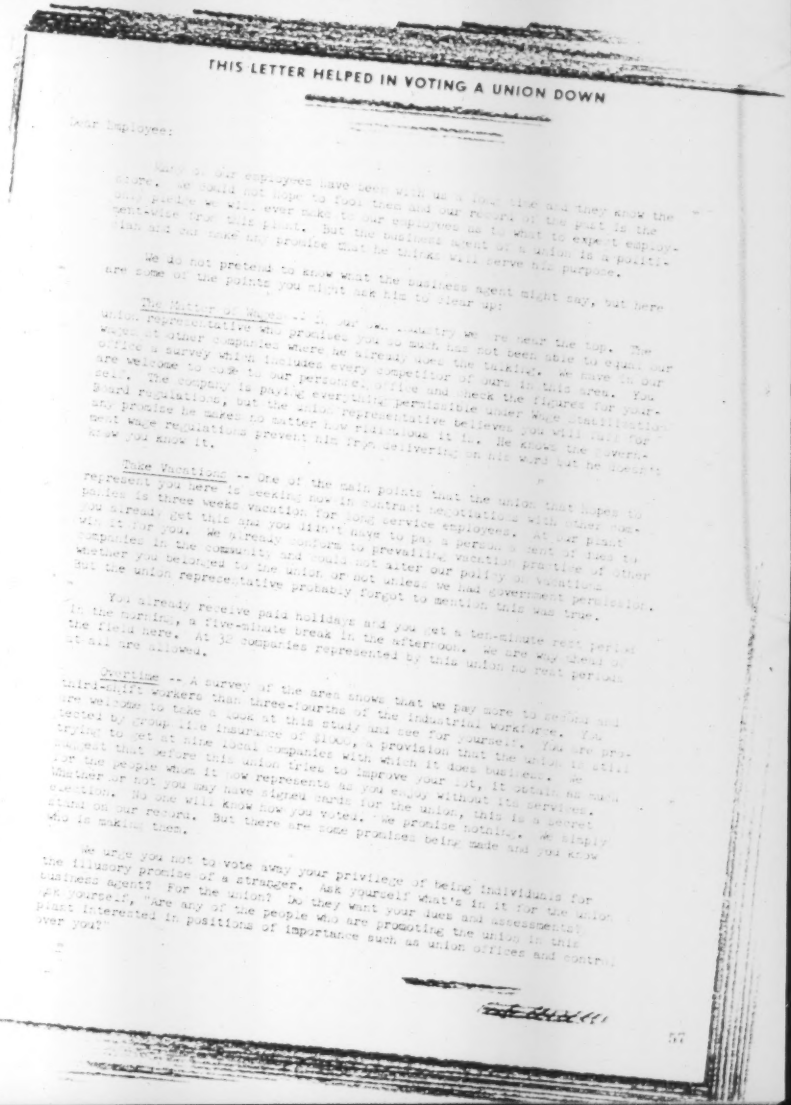
SMALL AND medium-sized plants are in the position of the three little pigs the union organizers will be trying to blow their doors down during the next few years.

Politics First — This fall the unions are going to concentrate on getting Adlai Stevenson into the White House. He won't be the labor leader Harry Truman is, but they figure he won't cry "wolf" either. If Dwight Eisenhower gets the nod, drives will be more spotty, less noisy but no less intense. But if it goes the Adlai way their membership drive will start next year to atone for the Murray defeat and sagging membership rolls relative to the growing work force (see STEEL, June 16, p. 67).

Unorganized small and medium-sized plants will be a big factor in their push and here's the way it will hit.

Cracks in Personnel Walls — Union business agents work on tips just like any other salesman and organization drives usually come as a result of an employee in a plant who has a real or fancied grievance of a personnel sort. The union will then exploit the event in its drive to organize the plant, explaining that such an injustice could never happen if the workers were union members. The event is a live issue for employees and makes a potent flail for whipping up anti-management sentiment.

To avoid incidents that give the unions their wedge and establish a strong bulwark against being approached by unions at all, set up a *written* personnel policy on everything from absenteeism to vaca-


THIS LETTER HELPED IN VOTING A UNION DOWN

Dear Employee:

We do not pretend to know what the business agent might say, but here are some of the points you might use him to clear up:

The Matter of Wages — As you can see, we're near the top. The union representative who praises you so much has not been able to show us a survey which includes every competitor of ours in this area. We have it in our office and are willing to show it to you. We know the figures for yourself, and we're willing to put everything permissible under wage stabilization Board regulations, but the union representative believes you will vote for any promise he makes to better his attractive offer whether he ever delivers or not. He knows the worst we can do is refuse it to you. He knows the worst we can do is refuse it to you. He knows the worst we can do is refuse it to you

tions say Associated Industries of Cleveland experts. Base it on what other companies in your area are doing and make your policies comparable. (After the union approaches your workers you can't make any changes without committing an illegal unfair labor practice.) Then be sure that your employees know what your personnel policies are and that your supervisors follow them to the letter without discrimination. That spikes the effectiveness of the grievance weapon. Workers could have told the griper what would happen and they won't sympathize with him.

If You're Approached — If you should be approached by a man who says he represents a majority of your workers, listen to him politely. Tell him that you understand the National Labor Relations Board will sanction an election if he has one-third of the employees in the plant petitioning for the union. Give him the impression that your plant is going to be a pushover to put him off guard.

Set up the NLRB election for a time when the majority of your employees will be available to vote such as shift-change or early in the morning if you have only one shift. Those who want the union will make a special effort to vote while those who don't may be indifferent. For the same reason hold the election in the plant where you know the employees will vote.

The Whites of Their Eyes—Then sit back and outwardly ignore the union and its statements until just before the election but gather your facts. Find out exactly what the union has done for the employees in other plants in which it has contracts and determine just how your plant stacks up.

When you see the whites of their eyes just before election day, give your employees the broadside of facts and *only facts*. You have the right under the Taft-Hartley Law to present the facts to your workers, but you cannot "influence" an employee's decision through anything that could be construed as a reprisal or reward.

The time to prepare for the union thrust is now. Build your personnel policies of concrete, competitive benefits and their huffing and puffing won't blow your door down.

All Clear!

Loudee Steel Corp., Montreal, Que., began operation of its new $500,000 hydraulic press for the conversion of scrap steel when Louis Deitcher, president, gave the signal. With a capacity of 75,000 tons a year, the press will help Canada's scrap industry to keep pace with its steelmaking industry which will have a million tons of new production facilities by mid-1953

More Titanium in Planes?

Titanium, a mighty metal in proportion to its weight, is undergoing a thorough examination by the Air Force.

Last week, a committee of Air Force brass met to discuss possible aeronautical uses of the metal at Air Material Command Headquarters at Wright-Patterson Air Force Base, near Dayton, O. Committee members drawn from various offices of AMC and the Wright Air Development Center studied available information as to machining, forming, welding and drawing the metal.

The committee then advised AMC's operating units on how to ease processing problems, keep supply and demand in balance and reduce the unit price of titanium.

In making its study, the committee requested industry for ideas on efficient production and use of the metal. Though the government may finance development, industry must do the actual producing and fabricating, says Brig. Gen. Kern D. Metzler, chief of AMC's Production & Resources Division.

Equipment Makers Stew in New Red Tape Brew

FRESH TROUBLE confronted the Office of Price Stabilization last week because of mounting protests from machine tool builders and other industrial equipment manufacturers over Revision 1, General Overriding Regulation 2, which became effective July 26.

It requires all suppliers, when doing business with the government or government contractors and subcontractors, to stamp or print their ceiling prices on their proposals and in their contracts and invoices. Told they are in violation, the machinery manufacturers declared the order is unworkable as far as they are concerned.

Complex — Machinery builders in general never have calculated their ceiling prices. To build and maintain their product, they use thousands of service parts the bigger companies use up to around half a million. It is impossible, they say, for them to set up a cost-keeping system which would enable them to comply with the OPS requirements for calculating ceiling prices.

At the same time, they contend, they know their current prices are well below ceilings, for they have refrained from adding one or more of the costs by which, in Supplementary Regulation 2, Ceiling Price Regulation 30, they are authorized to increase their prices — such as increased costs of materials, increased wages due to overtime and shift premiums, and increased subcontracting.

MAPI Protests—The matter is fast getting really serious; government officers are refusing to authorize payments because of noncompliance with Rev. 1 of GOR 2, and machinery builders say they are threatened with bankruptcy. One of the protests is from Machinery & Allied Products Institute which points out that Congress in Public Law 429, 82nd Congress, second session, provided that "burdensome and unnecessary

reporting and record-keeping retard rather than assist in meeting the purposes of this act" and that no cost reporting is necessary where the price is below ceiling.

OPS officials are considering what action to take.

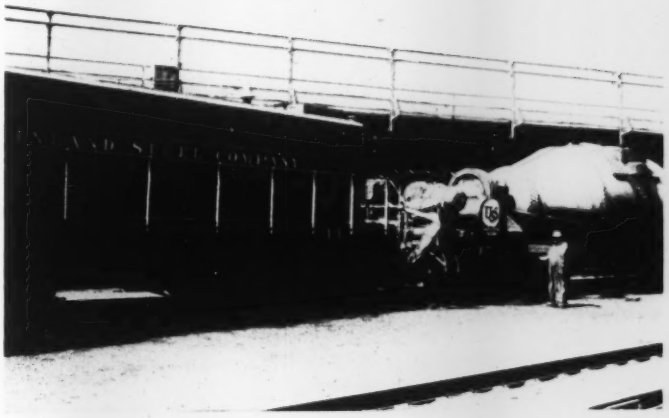
U. S. Steel Takes Profit Dive

United States Steel Corp.'s net income for the three months to June 30, which included 32 days of strike, was $22.2 million. Earnings for the first six months of this year were $65.7 million, as compared with $106.7 million for the first six months of 1951.

Second quarter earnings showed a loss of $20.8 million prior to tax credits as a result of strike conditions and after deducting $31.5 million of retroactive employment costs resulting from the new union agreement. This second quarter loss results in a reduction of normal and excess profits taxes reported in the first quarter, and also in a tax credit arising from an unused excess profits exemption applicable to first six months of '52.

Taxes which were set aside for the first quarter will cover the whole first six month period of 1952. This amounts to $43 million. This figure is shown as a tax credit in the second quarter. Taxes set aside for the first six months last year amounted to $180 million.

A 3.7 per cent return on sales was revealed for the second quarter this year. For the first six months of 1952 a 4.5 per cent return on sales was announced. This compared with a return of 6.2 per cent on sales for the same six month period last year.



All for One and One for All

Molten iron, "borrowed" from a blast furnace at Inland Steel Co.'s Indiana Harbor Works, East Chicago, Ind., starts its journey to the U. S. Steel Co.'s plant in Gary, Ind., where it will help offset losses caused by repairs to two steelmaking furnaces. The Inland furnace is reserve capacity which the company won't need until its new steelmaking furnaces are ready later this year. The two companies worked out the arrangement to speed recovery of steel production to capacity. The Pugh ladle carrying the molten iron is one of four built for use at U. S. Steel's Fairless Works, but it is being pressed into service at Gary

Pass-Through Allows for Full Metals Increases

MANUFACTURERS of metal products can mark up their prices by the full amounts of the recent price increases on steel, copper and aluminum. An order to this effect is in the final processing stage and should be announced early this week.

An additional order authorizing manufacturers to mark up their prices by the recent freight rate increases is in the works too.

A Different Story — Retiring OPS Director Ellis Arnall says, "As to increases in wages which the metal fabricators are paying or will pay in following the basic steel wage pattern, we are not dealing with this factor at all. . . . Manufacturers requiring price relief because of wage increases will have to use our earnings standard and if they cannot get all the relief they need under this standard they will have to look elsewhere."

The order will establish the following general pass-through procedure: Primary processors of steel, aluminum, and brass and copper wire mill products will be permitted to reflect immediately in their ceiling prices the exact amount of the cost increases which they have incurred as a result of the ceiling price increases authorized for these metals.

Price Pyramids—The increases in ceilings thus granted to primary processors will mean higher costs for many manufacturers at later stages of fabrication. These subsequent manufacturers will in turn be permitted to pass on such cost increases through to the final end product. Procedures will be established whereby manufacturers at each stage can determine the amounts of the increases to which they may be entitled.

A manufacturer may, at his option, adjust his ceiling prices step by step as soon as he is affected by any particular pass-through increase, or he may postpone his adjustments until he can reflect the full impact of pass-through increases.

Two Ways Out—The order will provide two general methods by which a manufacturer can calculate adjustments. First, he may calculate his cost increases for each commodity he produces separately on the basis of cost increases incurred for the metals used in that individual item. Secondly, a manufacturer may calculate an adjustment factor which will represent the average increase for a group of commodities.

OPS continues to work on iron ore and pig iron price orders and is considering coke prices.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

OUT TO LOWER THE RISING TAX TIDE
or just spooning with the voters?

Taxes probably won't be lowered significantly for some time to come, but businessmen can hope for a better distribution when the excess profits levy expires next June

WILL THE EXCESS profits tax be allowed to expire come June 30, 1953? Fresh interest in this question has been stirred by statements of both Messrs. Eisenhower and Stevenson that taxes can be lowered in the period ahead. They base this hopeful attitude on the belief that federal expenses can be cut materially. Recalling how Congress had to strain to effect the piddling economies incorporated in its appropriations for fiscal 1953, Washington wonders.

Now comes President Truman with his midyear budget report. It discloses an imbalance which tends to dispel optimism over the prospect of early tax reduction. We are going in the hole faster than ever.

Harry's Spade Work — Last January the President predicted a deficit of $14.4 billion for the year ending June 30, 1953. Now he estimates this deficit will be $10.3 billion, but adds that substantial supplemental appropriations will be needed to finish out the year.

In the meantime tax collections, though highest on record, are under expectations. Cold arithmetic threatens addition of another $12 billion to the debt by next July. This is in contrast to the fiscal 1952 deficit of $4 billion. The whole fiscal story makes for a poor prospect for any early tax reductions.

Same Hole, Different Shape— But in the new tax measure to be enacted next year businessmen will have an opportunity to shift the loads. There are many gripes over the existing tax law and its application. Mandatory normal depreciation of capital equipment over 20 years is an example. Though lower taxes may not be in the cards, businessmen should prepare to bombard the Ways and Means Committee with evidence of adverse effects of inequities. At least, they can fight for a better tax setup.

Officially "Historical" . . .

Histories of the steel strike are being written by all the government agencies which had anything to do with that occurrence, particularly by the Commerce Department which was responsible for operation of the steel plants during the seizure period, the Defense Production Administration which dictated controls aimed at making a maximum amount of steel available to the defense program during the strike, and the Defense Department whose production programs were disrupted to some extent by the strike. The writing of these histories is necessitated by statute. When written they will be filed in the archives for possible future reference, but may be read by interested parties.

Yugoslavia, No. 15 . . .

Yugoslavia is the 15th country in which United States business firms may make investments under a government contract insuring currency convertibility. This arrangement is of special interest to our metalworking industries because while Yugoslavia prohibits foreign ownership of its industrial enterprises it allows foreign investments in machinery imported into that country and services and processes furnished. Particulars may be obtained from Mutual Security Agency, Washington 25, D. C.

Nice Patent Medicine . . .

United States manufacturers whose patents and know-how are being used by NATO countries in the production of armament will receive fair compensation for their services. Such is the substance of an agreement still requiring ratification by the various governments, but approved by the top military representatives here.

Minerals Surveys Public . . .

To assist in carrying out the minerals and metals expansion program recommended by the Materials Policy Commission as essential to continued economic development and defense (STEEL, June 30, p. 46), the National Security Resources Board made public four hitherto restricted reports on antimony, nickel, lead and asbestos. Each presents a worldwide survey, with detailed statistics on resources, methods, production, marketing and consumption. Copies may be had from Superintendent of Documents, Government Printing Office, Washington 25, at $1.25 for "Antimony," $1.75 for "Asbestos," $3.50 for "Lead," and $2.00 for "Nickel." A similar volume on zinc will be published in the near future.

The Facts about
Electrical Controls for Fork Trucks
...and what they mean to you

YOU'VE BEEN HEARING many impressive sounding phrases such as "*automatic acceleration*," "*full contactor control*," "*non-plugging controllers*," etc., used by electric industrial truck salesmen to describe their controls. Some of you have asked us "What do these features mean to me in terms of performance and operating costs?"

Here are the Simple Facts:

Twelve years ago Baker recognized that careless operators were damaging trucks and loads by making "jack-rabbit" starts. Often motors were burned out by the high surges of current resulting from this abuse. The sudden jolting of loads frequently caused them to fall off the forks.

Even greater damage was caused by "truck jockeys" who jammed controls into full reverse while travelling forward in high speed. This is called "plugging" the motor, and is just about as disastrous and costly to the truck as it would be if you tried it on your car.

So, in 1940, Baker engineers attacked the problem of *controlled acceleration* to combat "jack-rabbit" starts. Trucks at that time all used drum controllers which cut out resistance in the circuit as the speed lever was advanced.

Baker Introduces Contactor Control

One of the first apparent improvements pioneered by Baker, was *contactor control*.

The contactor has many fingers which open and close to bring resistance in and out of the power circuit. A brief delay between the closing of each contact is required to provide smooth acceleration. On some electric-powered machines, dash pots, filled with graduated amounts of air, govern the closing of a bank of contactors to gain the desired effect.

For industrial truck purposes, however, we found that this system required more technical maintenance skill than was available in the average user's plant. Chief sources of trouble were fouling of the dash pots and the continued arcing as fingers opened and closed.

Obviously, a better method was needed to provide time delay. Baker then called in leading electrical experts and with their help developed a contactor with magnetically controlled time delay. This was a vast improvement, but the contactor still presented a complex maintenance problem. So, in 1943 Baker set out again.

Baker Rejects Full Contactor Control

As an alternative to contactor control, Baker engineers devised an ingenious acceleration circuit for the drum controller that required the operator to start in first speed and remain there for the split second required to stabilize current in the motor and get the truck rolling gradually and smoothly. *The truck could start in no speed but first.*

Tests proved satisfactory, so Baker moved to the next problem—"motor plugging" or immediate reversal of controls.

Baker Develops Dynamic Braking

Our engineers then designed a dynamic braking circuit which, when controls are reversed, brings the truck to a smooth stop before it reverses the current. This system uses the inertia of the truck to turn the motor—which, during deceleration, becomes a generator supplying current to prevent the reversing circuit from going into action.

The net effect is like shifting your car into second as against reverse, if you wish to slow down.

Dynamic braking is invaluable as an auxiliary brake on steep grades. *No other industrial truck manufacturer offers it as standard equipment.*

* * *

Now, to come back to the question "What does this mean in terms of performance and operating costs?"

Just this: Baker now provides simple and positive methods of *controlled* acceleration and deceleration. This means safer handling of loads and less wear and tear on truck and motor.

We pioneered the contactor system now in common use—only to abandon it for something better because of its staggering maintenance costs.

This is another example of the user-benefits researched and engineered by *Baker*, the oldest name in electric vehicles.

For a copy of a new 8-page booklet on Baker features and equipment, write for Bulletin 54.

Baker Industrial Trucks

The Baker-Raulang Co.
1259 West 80th St. • Cleveland 2, Ohio

LABOR ROUND-UP

A BIG LIFT for America's Steel Production

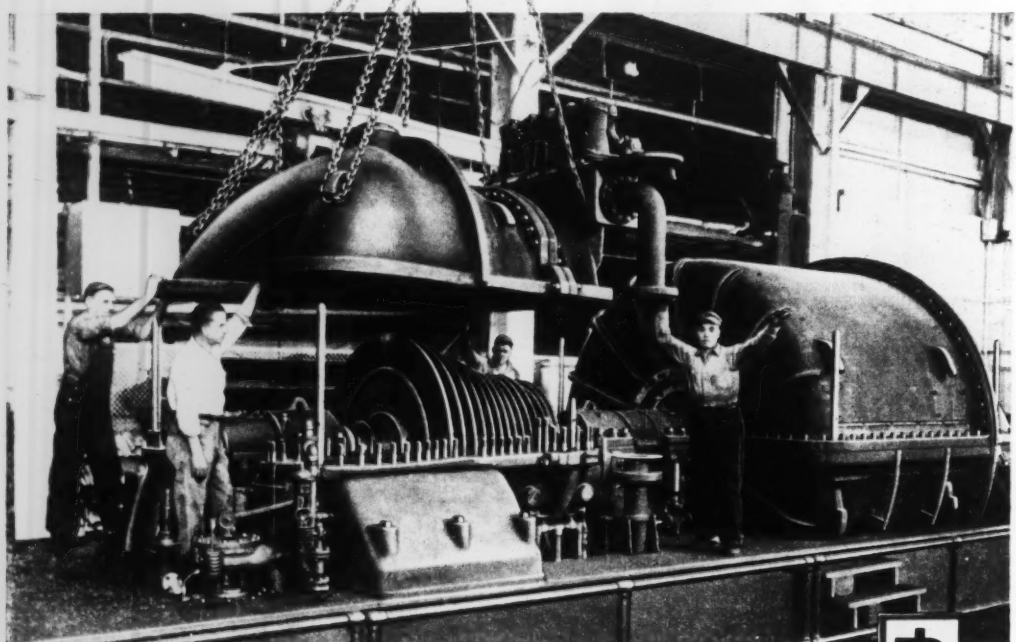
Three huge I-R Blast Furnace Blowers for U. S. Steel's new Fairless Works will help boost annual steel output by 1,800,000 ingot tons

In the photo below, a 12-ton turbine casing is being lowered into place on one of the three Ingersoll-Rand Turbo-Blowers for U. S. Steel's new Fairless Works at Morrisville, Pa. Each of these machines will have a capacity of 125,000 cubic feet of inlet air per minute against 35 psig.

Each of these five-stage centrifugal compressors is driven by a 15,750 horsepower steam turbine designed and built by Ingersoll-Rand for this specific service. They will normally operate on steam at 850 psi and 900°F. but will be suitable for operation on maximum steam conditions of 850 psig, 925°F.

The blast furnaces at Fairless are 110 ft. high and 28 ft. in hearth diameter. Each will be tapped five times a day, yielding around 300 tons of pig iron at a tapping—1,800,000 ingot tons per year.

For further details on I-R blowers or other I-R equipment, contact your nearest Ingersoll-Rand representative.



COMPRESSORS • AIR TOOLS
ROCK DRILLS • TURBO-BLOWERS
CONDENSERS • CENTRIFUGAL PUMPS
DIESEL AND GAS ENGINES

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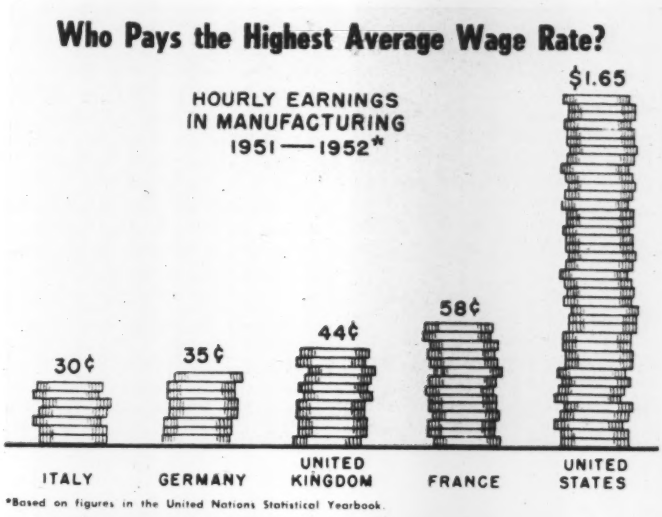
11 BROADWAY, NEW YORK 4, N. Y.

STEEL



German Labor Aims at Management

Hitler turned back German labor's hopes for more say in management, but the drive is again on for 50-50 codetermination. Wage increases are relatively unimportant

PROPHETIC perhaps, of the long-term bent of union demands in this country are the management rights gained by the West German Trade Union Federation in July. Mitbestimmungsrecht (right of codetermination) was the benefit to German labor; pay raises were not directly sought.

Under the new bill, German labor is given a one-third voice on boards of directors of almost all firms employing over 100 permanent workers, together with management and stockholder representatives and some voice at least in plants which employ five or more, but under 100, men. Policy matters like profits and sales, curtailment of production, shutdowns, relocation, merger, alterations, or introduction of new working methods all come within the sphere of codetermination. Exempted from the law were public utilities and civil service operations.

No Less Than Half—Not satisfied, WGTUF castigates this as less than the genuine 50-50 codetermination granted in coal, iron and steel firms a year ago.

Here's how the two plans work: In coal, iron and steel companies, five labor representatives (two must be from within the plant) and five stockholder representatives elect an "11th member," acceptable to both groups. They pass on all policy matters outlined above.

Men Wanted—Main stumbling block to the plan in the German iron industry has been a lack of qualified union representatives to sit in on policy discussions. To rectify the situation, the union is combining its ranks for bright young men to educate for the task. So far it has been hearts and flowers in the coal and steel industries, with union men going along on financial arrangements such as holding down wages and reinvesting profits in capital improvements.

For other than coal, iron and steel activities, labor casts one-third of the votes in nearly all German firms employing more than 500 workers. For firms employing more than 100 but less than 500 persons, workers' committees must be kept informed of policy decisions, including hiring and firing practices. For plants employing less than 20 persons, labor councils represent the workers in questions of contracts, welfare, grievances and training.

Look Within—Here again, lack of qualified union members is expected to slow down operation of the plan. In this case, labor's representatives must come from persons within the company concerned, instead of importing union officials from elsewhere.

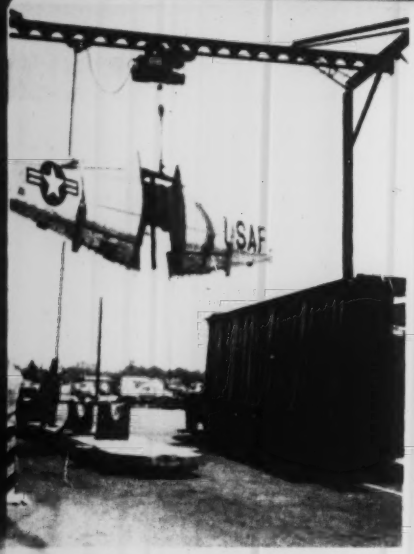
Nowhere have wage increases been the dominating factor in German labor demands. Workers are less interested in gaining illusive pay raises than in having a voice in where and how they work. How soon will U. S. labor shift emphasis in its demands from money to management?

Wage Troubles in U.K., Belgium

Labor demands elsewhere in Europe have more to do with money. The Amalgamated Engineering Union, second largest in Britain, spearheads a drive to disregard the old government argument against higher wages: Higher wages mean higher production costs which will price Britain's exports out of the world market.

Officially the Trade Unions Congress, largest British union with 8 million members, is against such wage increases. But, the rank and file show signs of wavering behind their leadership and the issue will reach a head at the TUC's meeting in September.

Belgian workers have already won wage hikes and fringe benefits which producers say threaten to price Belgian steel out of the world market (STEEL, Aug. 11, p. 65). That's a crucial issue since Belgium earns the greater share of its national income from exports of processing industries. Exports account for 65 to 69 per cent of Belgium's national income compared to 8 to 10 per cent for the U. S., 20 to 28 per cent for France, and 35 to 45 per cent for the U. K., says the *United Nations Bulletin*. Result: Belgian workers are losing more of their overtime work in the past two months.



Kansas-to-California Wing

This wing section for a Lockheed T-33 jet trainer was built by Beech Aircraft Corp. in its Wichita, Kans. plant and then shipped by truck to the Lockheed Aircraft Corp. plant in Van Nuys, Calif. It is one of 97 assemblies which Lockheed obtains from its subcontractors. The specially-built van, which holds four wings, makes the trip in 72 hours.

Need Working Capital?

If you have storage space in your plant, field warehousing may help you get it

MEDIUM - SIZED metalworking firms which are finding working capital hard to come by may find the answer to their problems in field warehousing, a method used to shake loose capital during the depression, when it got its big impetus.

Many firms have expanded to the point where their working capital has been practically depleted and lending agencies are asking for more security for loans. The only thing the producers have left is their inventories. A field warehouse may help them.

Here's How—Here is how it works: First, the producer must have storage space on his own premises. This can range from a closet to a complete warehouse, depending on the size of his product. Then the warehouse firm will lease that space on a 30-day basis for a nominal fee and throw up a fence around it with a padlock or simply post a 24-hour watch, depending again on the area. They will hire and bond a warehouse manager who will take an inventory of the material and issue the manufacturer a warehouse receipt.

That receipt, in most cases, is grade-A collateral and can be used as security for the loan of the money needed. It does not guarantee grade or title, but it does guarantee possession of the product by the warehousing company.

70 to 80 Per Cent—Many metalworking companies are taking advantage of this method. A. T. Bear, assistant vice president of Lawrence Warehouse Co., San Francisco, one of the largest in the business, says that in his area—Ohio—from 75 to 80 per cent of all Lawrence business is with metalworking firms, mostly medium sized. He says that the small manufacturers haven't the storage space and large outfits don't need that kind of assistance.

Mr. Bear points out that field warehousing is equally good for seasonal products as well as year-around goods. Parts as well as finished products can be stored on a producer's own property and moved in and out of the warehouse area, each movement being noted by the warehouse manager on the inventory list.

At present, Mr. Bear says, there are about 3500 Lawrence warehouses in the United States, Puerto Rico and Mexico. The number changes almost daily, because as a loan is repaid, the warehouse is dissolved.

Small Firms Are Alloted Shares in Expansion Goals

SMALL BUSINESS is allotted shares of industrial expansion goals for precision miniature motors, pumping machinery and materials handling equipment.

These shares were established under a new government program to assure that tax amortization benefits are not concentrated in large firms. The Defense Production Administration authorizes tax write-offs to companies expanding to produce essential materials. The Small Defense Plants Administration insures that some of these write-offs go to the nation's small business.

Goal for precision miniature motors is $6 million in new capital investment by 1954. Small companies (1500 employees or less) are earmarked for 33 per cent. About $1.6 million is still open for applications, says SDPA.

Makers of pumping machinery may apply for tax write-offs on a $35 million program of industrial expansion by July 1, 1954. The small business share (300 employees or fewer) is 20 per cent. About $7.5 million of the goal is still open for application by small companies.

Goal for materials handling equipment is a $26 million industry investment for new or extended facilities. Share of small business (300 employees or fewer) is 15 per cent. Open to application for fast write-offs is about $3 million of this defense expansion goal.

SELECTED DEFENSE CONTRACTS IN EXCESS OF $250,000

PRODUCT	CONTRACTOR
Lathes, Engine	South Bend Lathe Works, South Bend, Ind.
Toolmakers' Lathes	Monarch Machine Tool Co., Sidney, O.
Trucks, Crane	Federal Motor Truck Co., Detroit
Trucks, Dump	Mack Mfg. Corp., New York
Automotive Parts	Kendall Machine & Tool Co., Battle Creek, Mich.
Final Drive & Support Assemblies	Brad Foote Gear Works Inc., Chicago
Trailer Parts	Fruehauf Trailer Co., Detroit
Shells, 90 mm	Calumet & Hecla Consolidated Copper Co., Wolverine Tube Div., Boston
Automotive Tools	Joseph Weidenhoff Inc., Chicago
Metal Parts for Shells	Kelsey-Hayes Wheel Co., Detroit
Metal Parts for Primer Percussion	Calumet & Hecla Consolidated Copper Co., Boston
Parts for Boosters	Grand Rapids Hardware Co., Grand Rapids, Mich.
Lighters for Fuzes	Free Sewing Machine Co., Rockford, Ill.
Aircraft Parts	Beech Aircraft Corp., Wichita, Kans.
Air Speed Indicators	Kollsman Instrument Corp., Elmhurst, N. Y.
Inverters	Landers, Frary & Clark, New Britain, Conn.
Receiver-Transmitters	Belmont Radio Corp., Chicago
	Allen B. DuMont Laboratories, Clifton, N. J.
Mountings	Stewart-Warner Corp., Chicago
Control Boxes	Parkchester Machine Corp., New York
	Gray Mfg. Co., Hartford, Conn.
Parts for Governors & Turbines	Lionel Corp., New York
	Westinghouse Electric Corp., Pittsburgh

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administration Services Division, Temporary E Bldg., Washington 25.

Materials Orders

AIRCRAFT ALLOY STEEL—Amendment of Aug. 31, 1952, of Schedule 1 of NPA Order M-6A states that no aircraft quality alloy steel shall be delivered or accepted unless it is required by specification and incorporated into orders placed pursuant to a military program bearing allotment symbol A-4, A-5 or A-7 or is required under a program bearing the allotment symbol E-2 or for use in gas turbine and aircraft-type internal combustion engines for use on naval vessels. Amendment was effective Aug. 21.

OIL COUNTRY GOODS—Revocation on Aug. 21, 1952, of Direction 1 to Schedule 2 of NPA Order M-6A lifted all restrictions on the delivery of oil country goods invoked during the work stoppage in the steel industry.

ZIRCONIUM—Amendment 2 of Aug. 25, 1952, of NPA Order M-80 increases from 200 pounds to 15 tons the quantity of zirconium that can be used in steel production without being recorded on the monthly melt-sheet report. It was effective Aug. 25.

STAINLESS STEEL—Amendment of Aug. 25, 1952, of Schedule 5 of NPA Order M-80 permits the sale to or use by anyone with an authorized controlled material order of Type 347 stainless steel (columbium-bearing) in finished forms of structural shapes, plate, sheet, tube, strip, wire or bar that has been in inventory of producers and distributors for six months or longer. Formerly all Type 347 stainless was restricted to military or AEC use. Amendment was effective Aug. 25.

Controlled Materials Plan

FOREIGN, USED STEEL—Amendment of Aug. 22, 1952, of Direction 4 to CMP Regulation 1 authorizes steel consumers to acquire and use foreign and used steel free of allotment restrictions. It also permits persons to import Class A products without charging steel content of such products against their allotments. Amendment was effective Aug. 22.

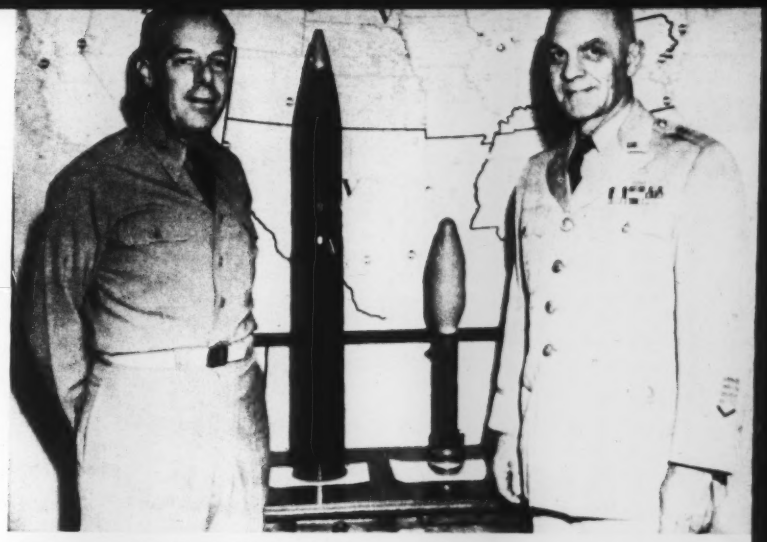
Price Regulations

MANUFACTURERS — Amendment 30 of Ceiling Price Regulation 36 and Amendment 12 of Ceiling Price Regulation 67 modify and clarify the definition of "manufacturer" as applied to manufacturers and resellers of machinery and related manufactured goods. If a person does not participate in the manufacture of a commodity to the extent specified in the amendments, he will establish his ceiling price under the resellers' regulation CPR 67 rather than the manufacturers' regulation CPR 30.

TIN—Amendment 13 of Ceiling Price Regulation 31, issued and effective Aug. 21, 1952, makes the determination of ceiling price for tin imports subject to CPR 31, the import regulation, instead of General Ceiling Price Regulation as formerly. This applies to tin metal, ore, concentrates, powder, scrap or alloys.

BOILER, PRESSURE TUBES — Amendment 5 of Ceiling Price Regulation 98, issued and effective Aug. 21, 1952, permits sellers of reconditioned quality re-usable boiler and pressure tubes to charge their customary pre-Korea differential for tubing upon which they perform hydrostatic testing, turbinizing and special crop ending. The amendment also modifies the method of calculating the jobber ceiling price of re-usable boiler tubes sold for line pipe purposes, based on the price of new prime quality plain-end seamless line pipe under Section 34 of CPR 98.

MANUFACTURERS—Amendment 37 of Ceiling Price Regulation 30, allows multiunit corporate manufacturers who own 95 per cent of the stock of subsidiary corporations to apply to the Office of Price Stabilization for permission to file a single report covering operations of the parent company and all its subsidiary company operations in calculating changes in net cost of materials produced in one unit of the business and transferred to another. Such manufacturers are permitted to continue their customary accounting practice of treating the entire corporate setup as a single unit in making reports on OPS Form 8.



Ordnance Center Changes Command

Brig. Gen. W. E. Laidlaw, left, became commanding general today of the Ordnance Ammunition Center, Joliet, Ill., succeeding Brig. Gen. Joel G. Holmes, who retired from the Army on Aug. 31. The Center controls 22 plants throughout the nation, all but one of which are operated by private companies. The 3.5-inch antitank rocket and the 105 mm recoilless rifle shell on the table are typical of the modern ammunition which last fiscal year cost the government $2.3 billion

Appointments in Washington

Robert L. Finley, formerly a member of the New York law firm of Spence, Hotchkiss, Parker and Duryee, was appointed special assistant to defense production administrator Henry H. Fowler.

Isaac C. Jeffery, formerly power manager of the Yellowstone District, Bureau of Reclamation, was appointed assistant chief, Minor Requirements Branch, Materials & Equipment Division, Defense Electric Power Administration.

E. Dorrance Kelly, director of the Rubber Division, National Production Authority, was named director of a new Office of Synthetic Rubber, Reconstruction Finance Corp.

Four appointments to the staff of the Petroleum Administration for Defense are announced: Harris Bateman, deputy director of the Materials Handling Division; W. G. Donley, assistant director of the Program Division; Joe Hall, chief of the Program Division's Domestic Petroleum Branch; Byron E. Francis, special assistant to the director, Gas Facilities Division.

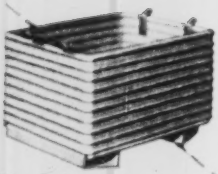
James W. Sibley, special representative of the general manager, Buick Division, General Motors Corp., Flint, Mich., was appointed deputy director of the Metalworking Equipment Division, National Production Authority. Mr. Sibley succeeds Lincoln Love who is returning to Ford Motor Co., Detroit.

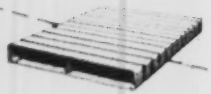
Edwin C. Garwood was appointed assistant deputy administrator for production, Defense Production Administration. Mr. Garwood will continue to serve as deputy assistant administrator, Industrial & Agricultural Equipment Bureau, National Production Authority.

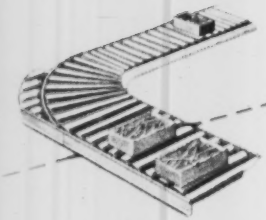
Leslie M. Case, formerly in the Houston sales office of the Chicago Pneumatic Tool Co., was named director, Mining Machinery Division, Industrial & Agricultural Equipment Bureau, National Production Authority.

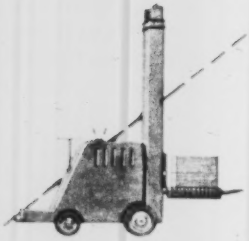
Warren E. Hoffman, manager of the Land Equipment Division, General Electric Co., Schenectady, N. Y., was appointed chief, Motor & Control Branch, Electrical Equipment Division Nationl Production Authority.

Handle materials better, more cheaply, with equipment made of









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HIGH-TENSILE STEEL

Minimum product weight and long product service are just two important reasons why N-A-X HIGH-TENSILE steel is ideally suited for tote boxes, pallets, conveyors, lift trucks, and other equipment used for transporting materials.

Because N-A-X HIGH-TENSILE steel has exceptional strength and durability, thinner sections can be used, yet it resists abrasion, impact, fatigue, and corrosion. N-A-X HIGH-TENSILE steel gives your equipment longer life and reduces deadweight to the minimum; you can carry a greater net load of material with no increase in the gross load weight. And N-A-X HIGH-TENSILE steel has exceptional welding and fabricating qualities – important advantages where custom-made materials-handling equipment is required.

If you are interested in better, more economical materials-handling, why not investigate N-A-X HIGH-TENSILE steel *now*?

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Specify N·A·X HIGH-TENSILE STEEL
... And "MAKE YOUR PRODUCT LAST LONGER."
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NATIONAL STEEL CORPORATION

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

You can't blame autoworkers for rejoicing. There's plenty of work, they can pick their jobs, and there's more money to jingle in their pockets

DETROIT

ON this Labor Day, 1952, autoworkers have good reason for rejoicing. Everything is now in their favor. Automobile production has bounced back, defense work is about to go great guns, they can take their pick of jobs, and, possibly best of all, they have more money in their pockets.

This is a great change from a month ago, when car and truck output was at the lowest point since 1946, no one was sure how long it would take to recover from the steel strike or whether full recovery would in fact be possible and the workers were getting one cent less per hour because of a drop in the cost-of-living index. Belt tightening was the vogue.

Fatter Paycheck — Today the autoworkers start drawing three cents more an hour now bringing to a total of 26 cents the cost-of-living allowance for hourly rated employees, and a check for about $130-135 will be waiting for salaried employees in December as their cost-of-living allowance for the preceding three months.

For the million or so workers covered by escalator-type contracts this extra money is not a pay increase. It just seems like that. It provides them with the same amount of purchasing power they had when the Bureau of Labor Statistics Consumers Price Index was 164. It now is almost 30 points higher.

Squeezed—For most companies which have these contracts there is no pat formula by which they can advance their prices to cover their higher labor costs and to keep abreast of their own "cost-of-living." A few parts makers are now considering tieing their prices to the BLS index and many whose product contains little labor and much steel have adopted a pricing formula based on prices of selected steel products. But for the automotive industry as a whole higher labor and materials cost can neither be absorbed nor passed on automatically.

Auto, Truck Output

U. S. and Canada

	1952	1951
January	409,406	645,688
February	467,691	658,918
March	517,207	792,550
April	576,505	680,281
May	546,674	695,898
June	560,952	653,682
July	227,460	522,858
August	325,500*	571,442
September		505,758
October		558,971
November		480,199
December		402,729
Total		7,179,161
Week Ended	**1952**	**1951**
Aug. 2	22,148	117,010
Aug. 9	43,964	97,351
Aug. 16	36,890	129,661
Aug. 23	110,639	138,797
Aug. 30	130,000*	137,479

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

The earnings prospect of the industry would be dismal but for three major factors—production of civilian vehicles will be higher next year—a conservative guess is about 25 per cent higher, defense output is swelling and will figure prominently in several automakers' profit position by next year, prices of cars and trucks will be up, competitive conditions setting the limit more effectively than OPS.

Problems, Problems — In the near-term the auto industry is confronted with serious cost and production problems. The sharp recovery in output in the last two weeks obscures these to the point where the casual observer forgets the steel strike. All makers are hand-to-mouth for material and the slightest delay in receipts means down time. This, in spite of dependence at the moment on conversion steel. Studebaker, forced back to a four-day week for lack of material, shows how close to the ragged edge all producers are. Also troubling suppliers and assemblers is the doubtful quality of some of the steel which was received soon after the mills resumed. In one case enough material is faulty that delivery schedules from the fabricator to users are in serious danger. Trouble may also develop quickly from the strike at Borg-Warner plants where the UAW-CIO is trying to win a master contract and a 26-cent an hour wage increase. Nearly all auto makers depend on one or more products of this corporation, which makes overdrive and automatic transmissions, clutches, gears, and other components.

Determined—When October begins the industry intends that its worst problems will have ended. Promised steel deliveries, augmented with conversion and foreign steel, offer encouragement that somewhere near the fourth-quarter quota of 1,150,000 cars can be produced.

Action of the NPA stirred up a tempest when it reallocated 1.32 percentage points of the industry's quota, spreading the 15,180 cars which this represents among the big three and Studebaker. The recipients of the higher percentage of industry figures were privately unhappy that they had benefitted by such small amounts. The redistribution falls far short of satisfying Ford, for one, and the independents whose quotas were reduced raged over the cut. Nash vows it should have had an increase instead of a reduction, and says it has already taken steps to bring about a change in NPA's decision.

This rhubarb undoubtedly will mean another hearing along the lines of that held to consider Ford's plea for a higher percentage of the quota.

Nash cites registration figures for the first months of 1952 to show that only it and Willys-Overland sold more cars this year than last.

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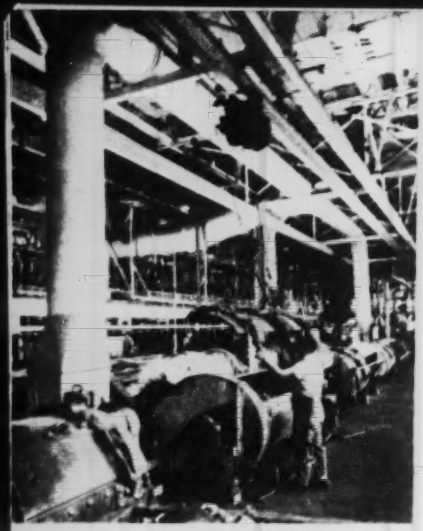


CASTINGS COMING CLEAN
dust collection cuts dirty work

Practicing What It Preaches

Buick Motor Division of General Motors is working hard to support the slogan "A foundry is a good place to work." The new castings cleaning department which has been added to its foundry in Flint, Mich., is one step in its program. Obvious by its absence is visible dust in this operation; 12 wet dust collectors, each capable of cleaning 35,000 cubic feet of air a minute, are installed on the roof. Suction pumps remove the dust-laden air from the tumbling mills in which small castings are cleaned, drawing it down to the basement. Exhaust hoods shroud every other dust-producing operation.

Unusual for a cleaning room is the building's construction. A full basement is used. In it, in open storage, are kept spare parts and supplies. This basement also houses magnetic separators for tramp iron in the core sand, and a centralized water system for removing used core sand from the building.

The cleaning room contains 184,803 square feet and is capable of handling 1,500 tons of castings per eight-hour shift. Just as Buick has automatized much of its core blowing operation, it has developed automatic equipment for many of the castings cleaning activities. Cylinder blocks and heads are led into grinding machines which in one pass clean top and bottom of these parts. Shot blasting is automatically done, and blocks travel on automatic conveyors through a hand grinding operation on recesses which cannot be reached by unattended grinders.

One very striking result of this mechanization is that castings from the foundry travel through the cleaning operations so quickly they are still warm when they leave the cleaning room.

Cooling a Hot Rumor

Rumors concerning upcoming models are flying thick and fast, despite efforts of the carmakers to keep from whetting the public appetite so that the 1952s no longer appeal.

One of the hottest rumors, concerning Pontiac's new model, was laid to rest by newly appointed General Manager Robert M. Critchfield who stated flatly that this GM division will not offer a V-8 engine in its '53s. Beyond that he has no comment on the changes which will be made. It is likely this engine will appear in 1954 when the machine tool situation is not so troublesome. One of the companies which will offer a V-8 for the first time on '53s is forced to machine some of the parts on standard machine tools because the special purpose equipment is not yet available. Three car makers are believed certain to go over the 200-hp level with their 1953 models Chrysler, Cadillac and Lincoln. The last named probably will have the highest rating, at about 215 hp.

New Machine Tool for Ford

This week a new transfer-type machine tool, costing in excess of $300,000, will be moved from Cross Co.'s new plant in Detroit to Ford Motor Co.'s Highland Park plant, where it will be put to work machining blocks for Ford's new four-cylinder overhead valve tractor engine.

Completion of this Transfer-Matic and its trial run preceded the formal opening of Cross's new facility. The new tool and the new plant are symbolic of the expanding use of special purpose machine tools. Cross has had two buildings in Detroit, but by adding a third which is used exclusively for final assembly it can expand its output by about 50 per cent.

The building had previously been a steel warehouse. Cross bought it in January, moved into it in February, and had it in operation about two months later. This is notable in view of the fact that complete remodeling was necessary and more than $1 million worth of special equipment had to be installed.

Manufacture and assembly of special purpose tools might be thought to be a job-shop operation. Nearly every tool is custom made, but Cross manages to use many common components to build up a special purpose tool. By that means batch production of parts and castings usually in increments of 50, is possible.

The initial subassembly of the machines is done on special work benches which can be attached for straight-line flow or separated for individual use. Small parts come from the Traverse street building and large parts from the main plant on Bellevue. Engineering is located in the new building at Mack and Bellevue.

The new Transfer-Matic consists of 23 stations, which perform 188 machining operations. Total time elapsed for these is 50 seconds. It gives the machine a production rate of 72 blocks an hour.

Studebaker Promotes Two

Two men widely known in automotive circles for their transmission engineering work have been elevated in Studebaker Corp. following the death of Stanwood Sparrow, vice president in charge of engineering. Named to Mr. Sparrow's post is Harold E. Churchill, formerly director of research. M. P. deBlumenthal has been promoted to chief research engineer. Mr. Churchill has been with Studebaker 26 years and is credited with development of the amphibious "weasel" during World War II.

Mr. deBlumenthal is a 17-year Studebaker veteran and in his post as assistant chief research engineer supervised Studebaker's automatic transmission development.

Sharon '430' is not a newcomer to the stainless

NEW PRODUCT DESIGNS DEMAND NEW MACHINING METHODS

This New Britain Automatic developed for contour facing jet compressor wheels

AUTOMATIC BAR AND CHUCKING MACHINES • PRECISION BORING MACHINES
LUCAS HORIZONTAL BORING, DRILLING AND MILLING MACHINES

NEW BRITAIN
Automatics
THE NEW BRITAIN GRIDLEY MACHINE DIVISION
THE NEW BRITAIN MACHINE COMPANY
NEW BRITAIN, CONNECTICUT

There's more to the Sharon 430 Stainless Steel Story than you might think!

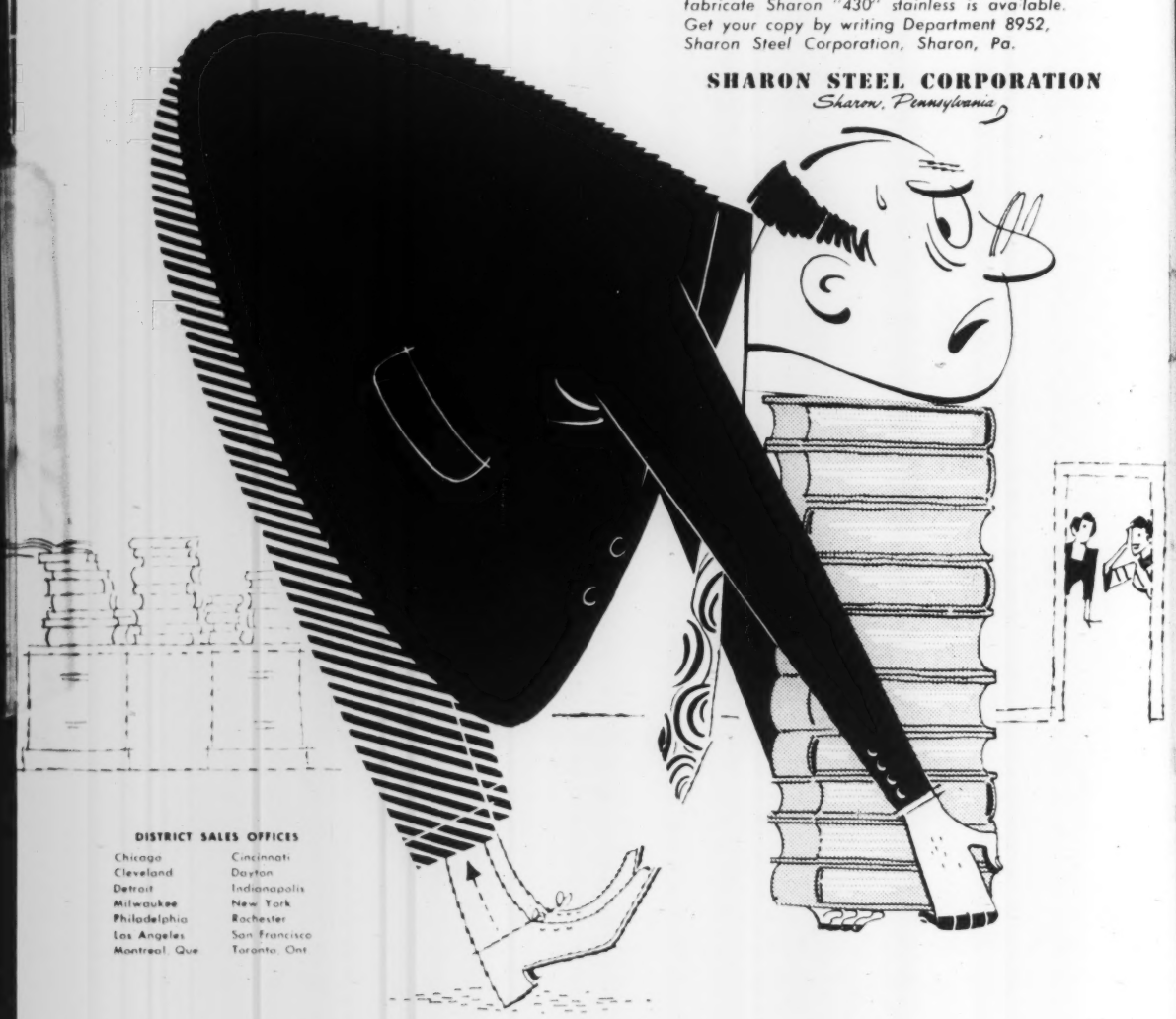
Sharon '430' is not a newcomer to the stainless family — quite the reverse. It is the granddaddy of successful stainless types. It antedates the chromium-nickel stainless steels by many years. It is a thoroughly tested steel with volumes of successful applications.

Automobile manufacturers have long used this material for complicated beading and trim where both the fabrication and end use have put it to critical tests. Hospital equipment, appliances, utensils, jewelry, hardware have all been made from Sharon '430' successfully. Absorption towers, used in the manufacture of nitric acid, built of '430' more than a quarter century ago, are still in everyday service.

Sharon '430' Stainless is available today with few restrictions as to end use.

A new booklet with instructions on how to fabricate Sharon "430" stainless is available. Get your copy by writing Department 8952, Sharon Steel Corporation, Sharon, Pa.

SHARON STEEL CORPORATION
Sharon, Pennsylvania

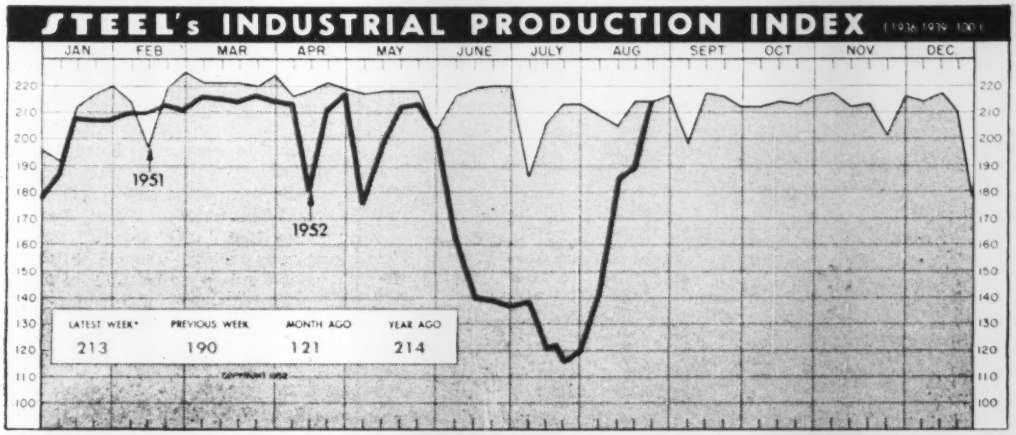


DISTRICT SALES OFFICES

Chicago	Cincinnati
Cleveland	Dayton
Detroit	Indianapolis
Milwaukee	New York
Philadelphia	Rochester
Los Angeles	San Francisco
Montreal, Que	Toronto, Ont

Sharon 430 *stainless steel*

SHARONSTEEL



*Week ended Aug. 23

Based upon and weighted as follows: Steelworks Operations 35%, Electric Power Output 23%, Freight Car Loadings 22%, and Automobile Assemblies (Ward's Reports) 20%.

Assembly lines may move at a good clip in the fall months if industry is unhampered by any more large strikes. Index returns to levels attained before the steel strike

THE FIRST of September is always a favorite point from which to get a sight on business conditions for the rest of the year.

The start of the fall months normally ushers in a seasonal speed-up in industrial activity. Plant vacations are ended and demand rises for many consumer goods industries.

Record—Most industrial machinery has been going at a fairly good clip. Our gross national product (total market value of the nation's goods and services) hit a record $343.2 billion in the second quarter, says the Commerce Department. This compares with an annual rate of $339.4 billion in the preceding quarter and $329.3 billion in the second quarter, 1951. While production has reached record heights, order backlogs of the metalworking category also have climbed steadily.

On June 30, unfilled orders for durables reached a peak $61.6 billion. This record probably was topped by a considerable amount in July and August, when the steel strike halted many production lines. Add to these factors, the possibility of a more than seasonal increase in the demand for consumer goods. A case in point is the appliance industry.

After a long sales drought, many appliance manufacturers now see a rising demand for their products in the fall and winter months. Makers of stoves, refrigerators, vacuum cleaners and other household durables are planning to step up output soon.

If the national industrial scene is not clouded by more large strikes we are certain to have a busy fall period this year.

Near Normal—As industry made substantial gains in its recovery from the steel strike, STEEL's industrial activity index jumped back to pre-strike levels in the week ended Aug. 23. While automotive output remained substantially below pre-strike turnout, freight car loadings and electric power generation rose considerably above. Steelworks operations climbed to 97 per cent of rated capacity in the week ended Aug. 23.

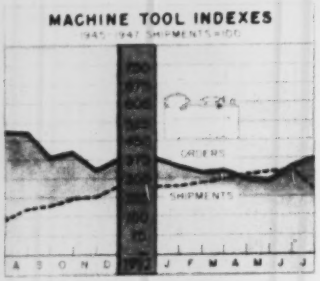
Steel Output Nears Normal . . .

The climb in steel production is losing some of its momentum, as output nears pre-strike levels. Steel plants produced 2,050,000 net tons of steel for ingots and castings in the week ended Aug. 30, estimates the American Iron & Steel Institute. This is an increase of 43,000 tons over the previous week.

Auto Assemblies Increase . . .

The automotive industry has been getting back on its feet. U. S. plants, shoving output to more than double the previous week's count, produced 82,886 car-truck assemblies in the week ended Aug. 23, says *Ward's Automotive Reports*. This total is nearly 86 per cent of the average weekly turnout in June, before the steel strike affected automotive production lines. Further increases in output rates last week were expected to bring the August turnout to 300,000 passenger cars and trucks—a 55 per cent increase over July, but a hefty 40 per cent drop from automotive production in June. To date, the 1952 turnout stands at 2,502,000 passenger cars and 714,000 trucks, more than 1.5 million behind the 3,793,000 autos and 967,000 trucks produced in the same months last year.

Combined U. S. and Canadian production reached 110,639 auto-truck assemblies in the week ended Aug. 23, over the previous week's

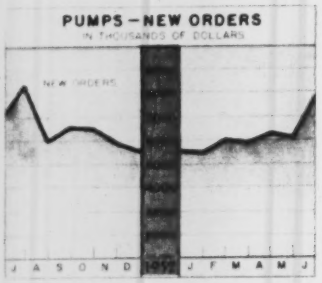


Machine Tool Indexes

1935-1947 Shipments = 100

	New Orders 1952	New Orders 1951	Shipments 1952	Shipments 1951
Jan	347.8	475.4	266.6	114.3
Feb	318.8	615.5	279.6	123.8
Mar	[illegible]	[illegible]	[illegible]	138.9
Apr	293.5	516.1	307.9	157.7
May	284.6	483.0	323.0	176.1
June	342.9	508.8	330.8	182.8
July	376.4	490.6	254.6	144.7
Aug		488.9		178.9
Sept		360.2		189.8
Oct		402.9		221.3
Nov		330.5		226.6
Dec		376.5		264.7

National Machine Tool Builders' Assn

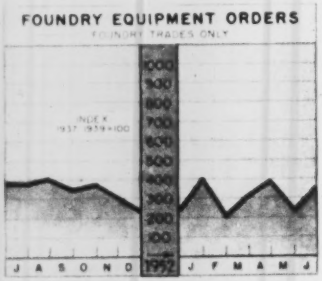


Pumps, New Orders

In Thousands of Dollars

	1952	1951	1950
Jan	5,517	6,477	2,586
Feb	6,020	6,480	2,935
Mar	5,925	7,654	3,113
Apr	6,354	7,583	3,376
May	6,130	6,371	3,695
June	7,957	6,562	4,153
July		8,308	4,080
Aug		5,911	6,429
Sept		6,502	5,191
Oct		6,506	4,985
Nov		5,908	5,961
Dec		5,553	6,720
Total		80,175	53,100

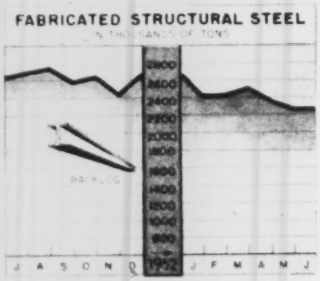
Hydraulic Institute



Foundry Equipment Orders

	Index 1952	Index 1951	Value Thousands 1952	Value Thousands 1951
Jan	304.5	668.0	$1,862	$3,079
Feb	260.4	638.6	925	2,940
Mar	310.0	569.0	1,427	2,758
Apr	385.1	490.1	1,773	2,206
May	225.2	431.7	1,037	1,987
June	353.8	393.2	1,629	1,810
July		390.3		1,797
Aug		404.5		1,862
Sept		346.5		1,595
Oct		372.4		1,714
Nov		305.5		1,406
Dec		230.5		1,061

Foundry Equipment Mfrs Assn



Fabricated Structural Steel

Thousands of Net Tons

	Shipments 1952	Shipments 1951	Backlogs 1952	Backlogs 1951
Jan	244.9	214.9	2,416	2,404
Feb	246.4	193.6	2,408	2,580
Mar	250.4	234.1	2,401	2,502
Apr	209.2	234.1	2,350	2,505
May	209.9	234.5	2,263	2,773
June	167.5	207.1	2,261	2,636
July		204.4		2,688
Aug		236.9		2,748
Sept		225.3		2,850
Oct		230.0		2,841
Nov		218.2		2,838
Dec		202.7		2,870
Total		2,865.5		

American Institute of Steel Construction

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Issue Dates on other FACTS and FIGURES Published by STEEL

Construction	July 21	Indus. Production	July 14	Ranges Gas	July 28
Durable Goods	Aug. 18	Ironers	Aug. 25	Steel Castings	Aug. 11
Employ. Metalwkg	Aug. 4	Malleable Castings	Aug. 11	Steel Forgings	Aug. 11
Employ. Steel	Apr. 28	Prices Consumer	Aug. 4	Steel Shipments	June 23
Freight Cars	Aug. 25	Prices Wholesale	Aug. 4	Vacuum Cleaners	Aug. 18
Furnaces	Aug. 25	Radio TV	July 21	Wages Metalwkg	Aug. 4
Gear Sales	Aug. 25	Refrigerators	July 28	Washers	Aug. 18
Gray Iron Castings	Aug. 11	Ranges Elec	July 28	Water Heaters	Aug. 18

total by 73,749 units but below output in the same period last year by 37,058 passenger cars and trucks.

Castings Output, Backlog Lag . . .

Order backlogs for gray iron and malleable iron castings continued to decline in June, despite severe production cutbacks caused by the steel strike. While shipments of gray iron castings were trimmed to 835,623 net tons in June from 1,100,630 tons shipped in May, unfilled orders dropped more than 13,000 tons to 1,445,521 tons of castings. Shipments of malleable iron castings fell 7000 tons to 74,446 short tons in June, while order backlogs also dipped 7000 tons to 173,353 short tons.

Unfilled orders for steel castings reached 846,459 short tons in June. Output dropped to 141,628 tons from May's 173,635 tons.

Electrical Goods Sales Up . . .

Makers of electrical equipment may find that the end of their sales slump is close. Sales by wholesalers of electrical goods in June jumped 9 per cent above the previous month and were 11 per cent over sales in June, 1951, reports the Commerce Department. But the cumulative sales for the first six months of 1952 lagged a good 13 per cent behind the same months last year. Inventories of wholesalers' electrical goods at the end of June plunged 8 per cent below the stock level on May 31 and were 28 per cent under stocks on hand on June 30, 1951. Total inventories of wholesalers' electrical goods at the end of June were estimated at $644 million.

Refrigerator Sales Warm Up . . .

In line with the upward trend of all electrical goods, sales of electric refrigerators and ranges moved upward in June. Factory sales of 374,199 refrigerators were nearly 46 per cent over those of May, says the National Electrical Manufacturers Association. This figure compares with the sales total of 261,298 units sold in June, last year, when the post-Korean consumer spending boom had just about ended. Sales of 86,847 electric ranges in June rose 40 per cent over those of May. This is

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	97.0	94.5	98.0
Electric Power Distributed (million kwhr)	7,650[1]	7,626	7,046
Bituminous Coal Output (daily av.—1000 tons)	1,652	1,600	1,713
Petroleum Production (daily av.—1000 bbl)	6,280[1]	6,278	6,220
Construction Volume (ENR—millions)	$1,366.1	$237.5	$188.9
Automobile, Truck Output (Ward's—units)	110,639	36,890	138,797
TRADE			
Freight Car Loadings (unit—1000 cars)	830[1]	805	838
Business Failures (Dun & Bradstreet, number)	154	141	130
Currency in Circulation (millions)[3]	$29,068	$29,051	$27,932
Dept. Store Sales (changes from year ago)[3]	+2%	+2%	-3%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$16,749	$15,210	$14,281
Federal Gross Debt (billions)	$263.0	$263.0	$256.4
Bond Volume, NYSE (millions)	$11.2	$13.4	$10.1
Stocks Sales, NYSE (thousands of shares)	4,747	5,068	6,103
Loans and Investments (billions)[4]	$75.6	$75.6	$70.3
United States Gov't. Obligations Held (billions)[4]	$32.5	$32.6	$30.9
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	181.40	171.92	171.92
STEEL's Nonferrous Metal Price Index[6]	223.2	223.2	224.6
All Commodities[7]	112.2	112.2	115.0
All Commodities Other Than Farm and Foods[7]	112.8	112.7	116.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1951, 1,999,035; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

substantially under the year-ago factory sales, which numbered 163,922 units.

Unemployment Rises . . .

Unemployment in metalworking companies increased by 400,000 workers between mid-June and mid-July, says the Commerce Department. Most of this decline was reported by automobile plants. About 900,000 workers were off payrolls in mid-July because of the steel strike, approximately half of these were steel workers and iron ore miners.

Claims for state unemployment insurance benefits also showed the impact of the steel strike. About 1 million workers applied for benefits at the end of June. These claims reached a peak of 1.4 million in mid-July. In early August, after the steel industry resumed operations, the number of claims dropped by over 100,000.

Fewer Firms Fail . . .

Business failures are remaining under the year-ago number of casualties. There were 13 per cent less casualties in July than in the same month a year ago, says Dun & Bradstreet Inc. This marked the fifth straight month that the number of business failures for the country had been below the same period in 1951.

Failures involving liabilities of $100,000 or more brought total liabilities to $22.8 million—the largest July level since 1935. Casualties among firms with liabilities of less than $5000 in July dropped to the lowest level since January, 1949.

Store Sales Drop . . .

As production of many durable items slipped, sales of retail stores in June declined 4 per cent below the previous month. Sales of autos and automotive equipment plunged to $1.9 billion from $2.5 billion in May, says the Commerce Department, while sales of home furnishing stores dropped $53 million to $586 million.

Trends Fore and Aft . . .

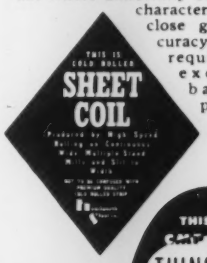
Metalworking companies paid back $15 million more than they borrowed in the week ended Aug. 13 . . . Bank clearings in the week ended Aug. 20 rose 10 per cent above the same week, 1951 . . . Crude oil output will reach 6.4 million barrels daily in September while demand will take only 6.2 million barrels, says the Bureau of Mines in its monthly forecast of market demand.

you're *always* sure of getting the *right* cold rolled "strip" steel from Kenilworth

Your costs — and profits — may hinge largely on the cold rolled strip steel you use.

To make certain you get the *right kind*, every coil of cold rolled strip steel we sell is *now* identified by one of these tags.

An economy material for simple forming operations and general use where uniformity of physical characteristics and close gauge accuracy are not required. An excellent base for paint and enamel.



For intricate fabricating operations where die life is an important factor of cost and all applications which demand precision and uniformity of gauge, chemistry and physical properties. Close gauge tolerances insure maximum "square footage" per ton.

Look for the TAG to insure lowest "end cost" on all your strip steel applications. If we can be helpful in selecting the right steel, just call on us.

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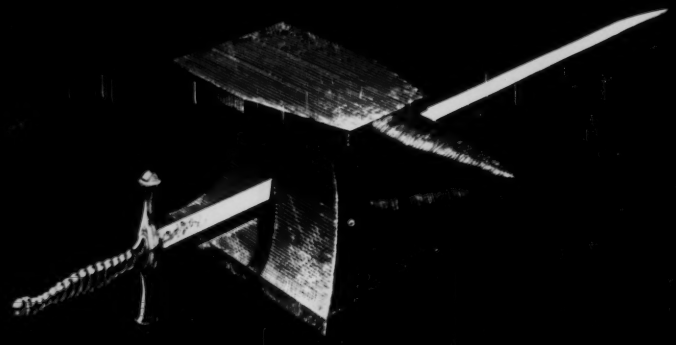

Famous Blades

Excalibur...
Blade of King Arthur... symbol of leadership

Created by the magician Merlin, Excalibur, the sword of King Arthur possessed great powers. Above all, it symbolized the authority and leadership of the King. Only Arthur, the true leader, had the power to remove Excalibur from the anvil in which it was embedded and wear it as ruler of all England.

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Users of Heppenstall Knives obtain exceptional service as represented by the following advantages:

- ★ MORE CUTS BETWEEN GRINDS
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- ★ LOWER OVERALL BLADE COST
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Your shearing and trimming operations can also benefit through Heppenstall Shear Knives. Make them your standard specifications today.

Heppenstall

Men of Industry

A. B. FISHER JR.
. . . a V.P., Koppers division

A. B. Fisher Jr., operating manager since 1951 of Freyn Engineering Department, **Koppers Co. Inc.**, Pittsburgh, was appointed a vice president in the company's engineering and construction division. In his new post Mr. Fisher will serve as executive assistant to the general manager and assistant general manager of the division.

Charles Kuhn was appointed sales manager, **Fansteel Metallurgical Corp.**, North Chicago, Ill.

Link-Belt Co. appointed **Albert W. Boegner** purchasing agent for its new Colmar, Pa., plant and **F. Walter Skerrett** to succeed Mr. Boegner as purchasing agent, Philadelphia plant.

J. J. Turner was appointed general sales manager, **Phoenix Iron & Steel Co.**, Phoenixville, Pa., subsidiary of Barium Steel Corp. He formerly was assistant general sales manager.

Adm. A. G. Noble, USN (ret.), was elected executive vice president, a member of the executive committee and a member of the board of **Nordberg Mfg. Co.**, Milwaukee. Since retirement from the Navy he has been vice president and general manager of Martin-Parry Corp. He assumes the new duties Oct. 1.

M. J. BURRESS
. . . V.P. Tay-Holbrook Inc.

M. J. Burress was elected vice president and director of industrial sales, **Tay-Holbrook Inc.**, San Francisco. Associated formerly with Crane Co., he has been active in the industrial supply industry for a number of years.

Orville A. Zimmermann was appointed office manager, Chicago district, **U. S. Steel Supply Division. Sylvan A. Boxdorfer** is office manager, St. Louis district.

William C. Portman joined **Charles Wm. Doepke Mfg. Co. Inc.**, Cincinnati, as sales manager of its Nes-Tier Division. He resigned from the vice presidency of Flow Equipment Co.

Kaiser Aluminum & Chemical Sales Inc. appointed **Wallace A. Davidson** as manager of its Kansas City district office; **Donald F. Sheridan,** head of the Wichita, Kans., office; and **Richard E. Hanson** assistant to the general sales manager, Chicago office.

Sands G. Falk was named manager of the newly combined foundry and weldment sales divisions of **Falk Corp.**, Milwaukee. He was foundry sales manager. **A. R. Peroutka,** formerly in weldment sales, was named assistant manager of the distributor sales division.

H. F. KLUENDER
. . . Visi-Trol Corp. director & sec.-treas.

H. F. Kluender was appointed secretary-treasurer and director of **Visi-Trol Corp.**, Detroit manufacturer of production control and quality control equipment. He joined the company in 1949 as sales manager, and previously was vice president and general manager of Detroit Alloy Steel Co. for many years, becoming vice president and general manager of Detroit Gray Iron Foundry Co. when the two organizations merged.

David E. Neustadt joined **Chas. Rivitz & Co. Inc.**, Cleveland, as vice president and general manager. He was formerly California representative for American Wheelabrator & Equipment Co.

Mosler Safe Co., Hamilton O., announces **Edwin H. Mosler Jr.** as president. Formerly a vice president, he succeeds his father, the late **Edwin H. Mosler Sr. Harry H. Lynn,** formerly executive vice president, was elected to the newly created post of board chairman.

Raymond C. McCullough was named divisional sales manager, **Bohn Aluminum & Brass Corp.** He was district sales manager, Chicago office, and now makes his headquarters in Detroit. He is re-

placed at Chicago by **Richard C. Aylward**. **J. L. Adams**, former divisional sales manager, was promoted to assistant to the president.

Kenneth J. Hagadorn was appointed assistant superintendent of engine control manufacturing at **General Electric Co.'s** plant at Westover, N. Y.

Samuel D. Kapelsohn was appointed manager, construction department, **Luria Engineering Co.**, New York. Since 1950 he has been contract manager and general superintendent for Peerless Construction Co., and during the preceding 24 years was with Taylor Fichter Steel Construction Co., Inc.

Hydro-Aire Inc., Burbank, Calif., appointed **Fred H. Newcomb** industrial relations manager.

Lawrence P. Head was appointed sales engineer to the St. Louis regional office of **Cooper-Bessemer Corp.**

Louis V. Gagnon is Massachusetts sales representative for **Frederic B. Stevens Inc.**, Detroit.

William J. Martin Jr. was transferred from the Cincinnati office to the Cleveland office of **Peninsular Grinding Wheel Sales Corp.**

Thomas S. Collins was appointed electrode representative for the Chicago territory of **McKay Co.**

John C. Durbin Jr. was appointed a factory sales representative for **New York Belting & Packing Co.** He will have headquarters in Portland, Oreg.

Farrel-Birmingham Co. Inc. transferred **Elmer F. Myers**, sales engineer, to Fayetteville, N. C. He has been covering the New England territory.

C. W. Diven Jr. was appointed assistant sales manager of the Philadelphia district of **Sharon Steel Corp.**, Sharon, Pa.

Jeffrey Mfg. Co., Columbus, O., made the following changes in its district office personnel: **Carl Verhine** of the Columbus office was added to the Milwaukee sales staff. **J. A. Lowry** was transferred to Columbus from New York; and **Elmer Longnecker** goes to Detroit from Columbus replacing **Robert Monsarrat**, named manager at Philadelphia.

Robert D. Walker was appointed to the staff of industrial sales engineers of **Weatherhead Co.**, Cleveland. His territory will cover Arkansas, Louisiana, New Mexico, Oklahoma and Texas.

Whitney Chain Co., Hartford, Conn., appointed **Anthony J. Swisler** regional manager for the West Coast and **George A. Banton** district manager of the southern California and Arizona territory.

W. ROY WIDDOES
on president's staff, Lukens

W. Roy Widdoes, director of industrial relations, **Lukens Steel Co.**, Coatesville, Pa., was appointed to the president's staff. He will be secretary of the management committee and will also take charge of certain phases of future planning for the company. **W. C. Robinson** becomes acting director succeeding Mr. Widdoes.

New Departure Division, General Motors Corp., Bristol, Conn., reorganized its engineering department to broaden activities associated with research, engineering, development and application of instrument ball bearings, and announces formation of a special section. Named to head up the activity is **Kenneth D. Mackenzie** who assumes the title of assistant chief engineer. He formerly was assistant plant manager of the division's operations at Meriden, Conn. **Raymond J. Lynch**, also an assistant chief engineer, will be in charge of all other bearing applications.

Flexible Tubing Corp., Guilford, Conn., appointed **Robert H. Poulton** as representative-technical sales.

John L. Baird retired as a vice president and director, **Atlas Equipment Corp.**, Pittsburgh. **David L. Frawley** was named to the directorship.

Seymour C. Beidner, former board chairman, Appalachian Steel Corp., was elected president of the newly formed **Jefferson Steel Corp.**, specializing in sheet steel and tin mill products. The new company opened its New York executive offices in the Empire State building.

J. H. Brinker Jr. was appointed assistant executive in charge of distribution for **A. O. Smith Corp.**, Milwaukee.

Robert W. McLean was named Pacific Coast market development representative for **Westinghouse Electric Corp.** with headquarters in San Francisco.

Capt. Leo B. Farrel, USN (ret.), joined **Seaporcel Metals Inc.**, Long Island City, N. Y., fabricator of porcelain enamel architectural and marine products, as director of regional sales.

John F. Weaber was transferred from the Syracuse, N. Y., sales office of **Lukens Steel Co.** to the Cleveland district sales office to become resident salesman in Columbus, Ohio.

Lukens Steel Co.'s new sales office in Cincinnati will be operated under jurisdiction of the Cleveland district sales office under direction of **Harry K. Tryon**, a member of the sales staff in Cleveland.

George O. Manifold, professor of mechanical engineering at the University of Pittsburgh, was ap-

"Bill, making or losing money today

can depend on

The Turn of a Screw!"

"Stop pulling my leg." Bill retorted skeptically.

"I'm not exaggerating. You can't afford to take your fasteners for granted," Bob insisted. *"I'm saving time—and time is money—just by following the RB&W man's suggestion to use another kind of screw in my TV sets."*

"What kind?" asked Bill.

"RB&W's new SPIN-LOCK Screw," answered Bob. *"It has a patented feature—ratchet-like teeth under the head—that not only locks into the surface and holds tighter, but also speeds assembly. It does away with extra parts and special handling. Bet your switches could use 'em, Bill."*

MORAL: Look to your fasteners for an often overlooked opportunity to reduce costs, and strengthen your competitive position. New fasteners may prove more efficient than the ones you're now using. Or you may save by the stepped-up production you get from using the finest fasteners . . . RB&W bolts, nuts, rivets and screws of uniform accuracy, dependability and physical properties.

Let RB&W help you make the most efficient use of fasteners on your assembly line. Address RB&W at Port Chester.

RB&W—The Complete Quality Line. Plants at: Port Chester, N.Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Dallas, Oakland. Sales agents at: Portland, Seattle. Distributors from coast to coast.

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E. DOUGLAS REDDAN
. . . gen. sales mgr., Fireye Corp.

DONALD W. DAWSON
. . . a sales mgr., American Welding & Mfg.

A. B. EGAN
. . . Sheffield's Kansas City sales mgr.

pointed director of education of **Hagan Corp.**, Pittsburgh. His headquarters will be in Orrville, Ohio.

Fireye Corp., Cambridge, Mass., announces that **E. Douglas Reddan** joined the organization as general sales manager. He has been associated in executive sales positions for a number of years with Walter Kidde & Co. Inc.

Donald W. Dawson becomes manager of sales, building products division, **American Welding & Mfg. Co.**, Warren, O. He joined American Welding in 1947 as manager of sales promotion, and for two years has been manager, product development and advertising.

M. R. Wilson, general sales manager, **Thor Corp.**, Chicago, resigned.

Changes in the sales organization of **Sheffield Steel Corp.**, effective Sept. 1, are: **A. B. Egan**, formerly manager of sales, reinforcing products division, appointed manager-sales, Kansas City area; **R. W. Davison** named assistant manager—sales, Houston area; and **W. H. Leo**, manager—sales, construction products division, with offices at Kansas City, Mo. He was formerly Dallas district manager.

OBITUARIES...

Whipple Jacobs, 55, president, **Phelps Dodge Copper Products Corp.**, New York, fabricating subsidiary of Phelps Dodge Corp., died Aug. 18 at his summer home in Pipersville, Pa. He formerly was president of Belden Mfg. Co.

William R. Phillips, 59, production manager of **American Can Co.**, Geneva, N. Y., died Aug. 22.

Sherman L. Kelly, 83, inventor and one of the founders of **Electric Auto-Lite Co.**, Toledo, O., died Aug. 21.

James C. Shepherd, 57, executive vice president, **Sheffield Steel Corp.** since 1941, died Aug. 25 at Kansas City, Mo.

S. W. Sparrow, 61, vice president in charge of engineering for **Studebaker Corp.**, South Bend, Ind., was killed in an automobile accident Aug. 14.

John A. Zapf, chairman of the board, **Schultz Die Casting Co.**, Toledo, O., died Aug. 9.

Edward A. Brewer, 69, chairman of the board and former president of **Brewer-Titchener Corp.**, Cortland, N. Y., died Aug. 22.

Raycroft Walsh, 63, vice chairman and director, **United Aircraft Corp.**, died in Westerly, R. I., Aug. 17 after a short illness.

R. H. Sturgeon, 53, sales manager, Pacific Northwest district, **Harnischfeger Corp.**, died Aug. 9.

Edward E. Mix, 59, partner in **Bronson Fan Mfg. Co.**, Los Angeles, died Aug. 16.

Hugh J. Fraser, 54, vice president in general charge of all plant operations in the United States for **International Nickel Co. Inc.**, died Aug. 22 in Montreal, Canada.

W. R. Ray, 73, chairman, **General Controls Co.**, Los Angeles, and founder and president, Ray Oil Burner Co., San Francisco, died Aug. 14.

Sanford Stephenson, 55, manager of wire and wire products sales, **Bethlehem Pacific Coast Steel Corp.**, San Francisco, died Aug. 18.

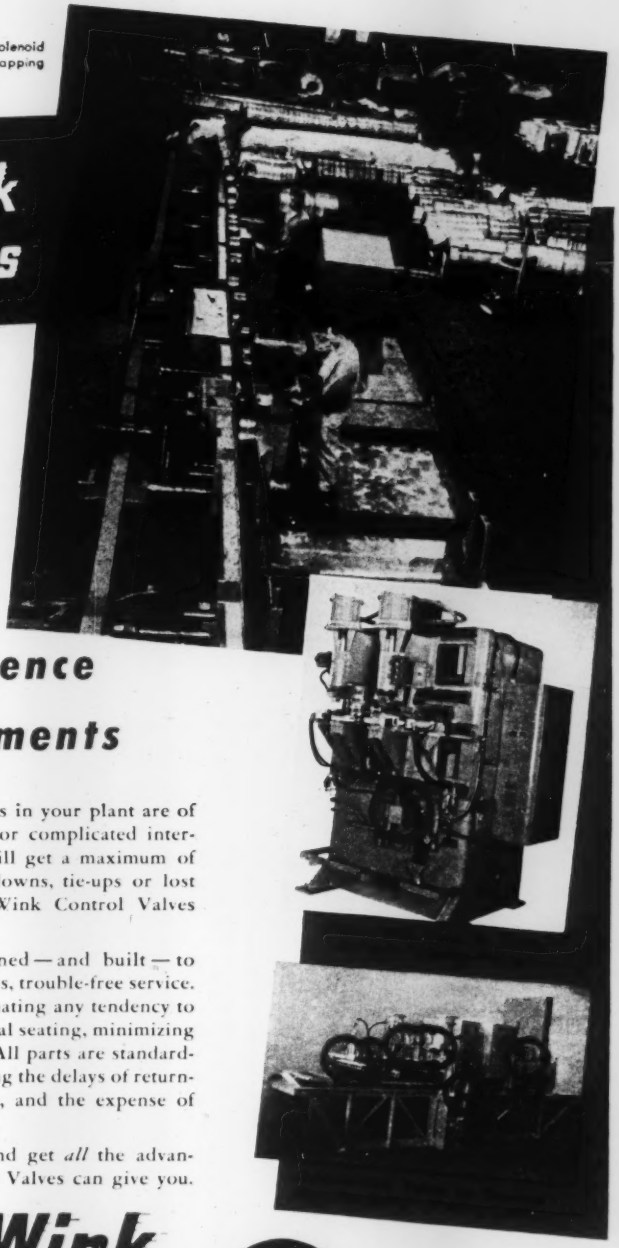
Herman Berg, 62, superintendent of **Kelly Reamer Co.**, Cleveland, for 27 years, died Aug. 18.

Norman Barratt, assistant general manager, Canadian division, **American Can Co.**, Hamilton, Ont., died Aug. 14.

E. C. Greisen, 68, an application engineer at **Allis-Chalmers Mfg. Co.**, Milwaukee, died Aug. 14.

Quick-As-Wink Double Solenoid Air Valves on Coil Strapping and Oiling Line.

Quick-As-Wink Control Valves



fast, positive dependable action for single or sequence machine movements

● Whether the machine movements in your plant are of the relatively simple "on-off" variety, or complicated interconnected sequence operations, you will get a maximum of long, efficient service, without break-downs, tie-ups or lost time, by standardizing on Quick-As-Wink Control Valves throughout your plant.

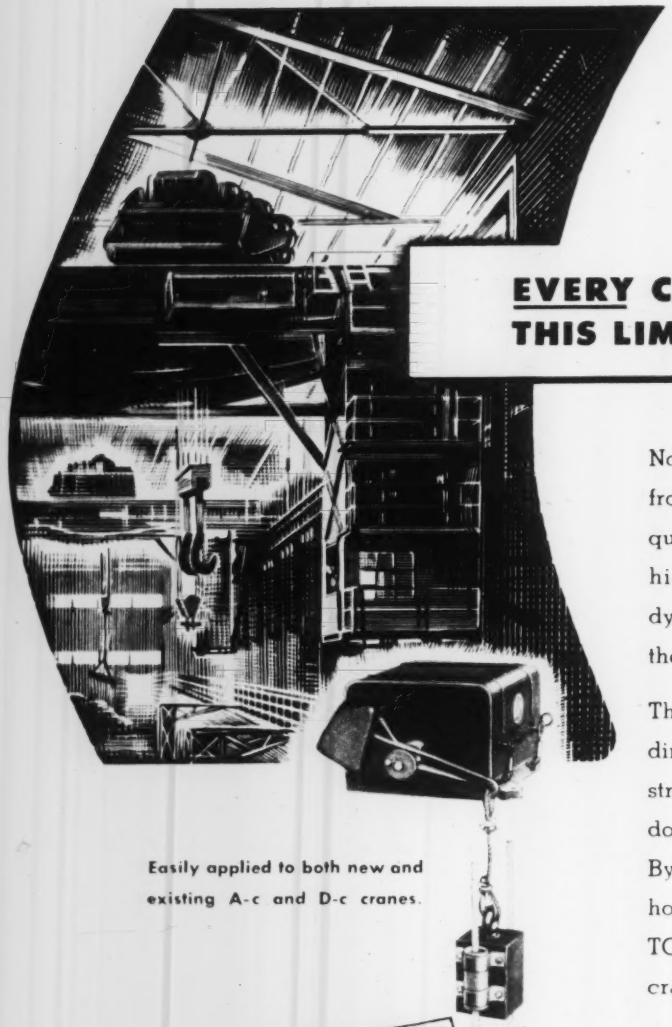
Quick-As-Wink Valves are designed—and built—to maintain highest standards of continuous, trouble-free service. All parts are in pressure balance eliminating any tendency to creep or crawl. There is no metal to metal seating, minimizing wear and reducing maintenance costs. All parts are standardized and readily interchangeable avoiding the delays of returning valves to the factory for servicing, and the expense of maintaining large standby inventories.

Standardize on Quick-As-Wink—and get *all* the advantages that *only* Quick-As-Wink Control Valves can give you.

Quick-As-Wink
AIR AND HYDRAULIC
Control Valves

Hand, Foot, Cam, Diaphragm and Solenoid Operated

Mfd. by C. B. HUNT & SON, INC., 1911 East Pershing St., Salem, Ohio



Easily applied to both new and existing A-c and D-c cranes.

YOUNGSTOWN Safety LIMIT STOPS for Crane Hoists

EVERY CRANE* NEEDS THIS LIMIT STOP

Not only disconnects the motor from the line, but stops the motor quickly. On D-c cranes, where high hoisting speeds prevail, dynamic braking aids in bringing the hook block to rest.

These Limit Stops are operated directly by the hook block, hence stretching of the hoisting cables does not affect the tripping point. By removing the fear of an over-hoisting accident, the YOUNGSTOWN Limit Stop enables the crane operator to do better work.

* A crane *without* a Youngstown is as risky as a boiler *without* a safety valve.

Ask for Bulletin 1032 describing the Youngstown Safety Limit Stop and its many advantages.

E&M

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Production AND Engineering
NEWS AT A GLANCE

LUBRICANTS WITH STRETCH—You soon may be able to operate electric motors continuously with fewer relubrication intervals. New high temperature lubricants developed by the Office of Naval Research, in co-operation with leading manufacturers of motors, bearings and lubricants, will permit continuous operation of motors at 300° F with relubrication at intervals of between 500 and 1000 hours. Motor design changes indicated by the study will increase greatly these intervals. The silicone-lithium soap greases give good performances for as high as 6000 hours; at 100° temperatures they stand up 10,000 to 15,000 hours. Factors to be considered in future design are: Seals, or shields to prevent bearing grease loss, ball cages of selected nonferrous metals, and use of bearing steels stable at higher temperatures.

APPROACH TO CONSERVATION—Political and geographic barriers are shrinking important raw metal sources of the nation. Result is a program of strict conservation and liberal substitution. One of the first efforts of a company in its approach to conservation is to require the designer to study all its products, and determine which ones can be produced successfully from alternate materials. What the steel and allied industries are doing may provide some food for thought. p. 82

MOLD BOND WITH A GRIP—A critical material handling problem in the shell molding process is solved by a new adhesive developed by World Bestos of New Castle, Ind. The development, which is applied to shell mold halves either as a film or liquid, when cured, securely bonds the halves without the aid of clamps or bolts. The adhesive can be applied closely to the casting cavities and holds the mold evenly with great strength. Use of shot or silica sand backing of most molds also is eliminated. In addition, the bonding adhesive disappears in the shell reclaiming process.

NUMBERS "DRIVE" MILLER—Borrowing a page out of automatic teletype developments, and one out of military automatic fire-control techniques, scientists at Massachusetts Institute of Technology evolved a milling machine that cuts hours of work. The miller operates in response to numbers punched on a paper tape, and represents a new step in the automatic control of machine tools. It substitutes mathematical operations performed on computing devices for many hand operations now required. In minutes it completes setup tasks that take hours in current practice.

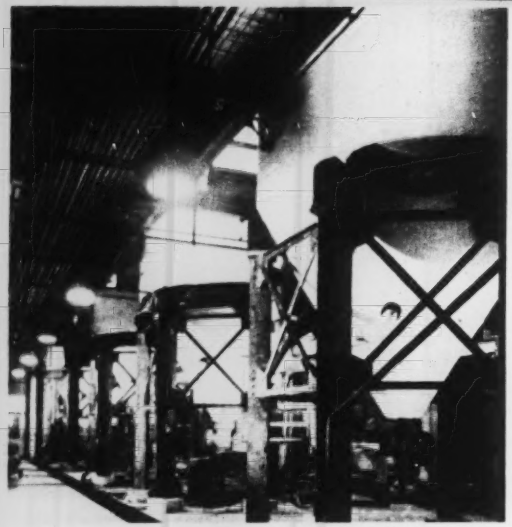
MECHANICAL PRODUCTION LINE—The machine tool used in Ford's engine plant in Cleveland for producing finished 6-cylinder engine blocks from rough castings is longer than five football fields laid end to end. If placed in a straight line this serpentine mechanical dragon would extend 1545 feet. Actually, the tool consists of a series of 42 automatic machines synchronized together to form a single unit by automatic transfers and other devices. It performs, with a precision unknown to human hands, 530 cutting and drilling operations on each casting before offering it as a finished block.

NO SHOCK, BETTER HAMMER ACTION—Those jarring blows delivered by forging hammers which create havoc with expensive linings of nearby heat treating furnaces and precision tools and instruments, can be completely controlled. Tests conducted on a Korfund spring isolated hammer foundation at Steel Improvement & Forge Co., Cleveland, indicate the system provides such complete shock control that a coin remains balanced on edge right beside the isolated hammer as repeated maximum blows are struck. Comparative tests on a non-isolated and a spring isolated hammer also demonstrated that the blow efficiency of the latter increased slightly over that of the non-isolated hammer.

CLICKITY-CLACK NO MORE—If you miss that familiar clickity-clack while riding the Rock Island lines west of Peru, Ill.—you'll know you're riding on continuous type steel rail. The railroad is in process of laying the first 5-mile strip of rail in its quest to reduce ever-mounting maintenance costs, and provide a more comfortable ride for its patrons. The rail, in 1500-foot lengths required 40 flat cars to get it on location. Welds are used to join the lengths together. Outcome of this initial installation will determine the practicability of the rail for wider use.

METALWORKINGS—There is still a lot of manpower being wasted in many plants today. One steel fabricator by substituting horsepower for manpower in the form of a handling truck came out on the black side of the ledger by $9152 per year (p. 85) . . . Building solid engine blocks by a sandwich technique involving simple castings may one day revise present automakers' methods (p. 88). Alcoa is doing it with aluminum castings, and furnace brazing the components into one . . . Diesels are coming back with a roar at Packard. Family of four engines (p. 90) which already has interested the Navy to a tune of $90 million will be felt in the marine, industrial and commercial fields . . . A new process and new furnace team up to produce bright scale-free work (p. 92). Protective atmosphere generated during the tempering cycle eliminates cleaning operations . . . Use of steam for atomizing fuel oil at a Holland steel plant provides a luminous flame that increases heat transfer (p. 94) . . . Chief advantage of using crush grinding on surface broaches is faithful reproduction of many cutters of identical accuracy (p. 103).

Metalworking Outlook—p. 45 Market Outlook—p. 129



Bank of four pulp digesters lined with type 316L. Total weight of columbium conserved here was over 700 pounds

STRATEGIC ELEMENTS

Emphasis

Political and geographic barriers have wiped out important raw metal sources from U. S. Result is a program of strict conservation and liberal substitution

By J. G. TERRY
Development Engineer
Armco Steel Corp.
Middletown, O.

WAR is always wasteful, especially in the enormous expenditure of natural resources required to sustain a fighting force. Extreme safety factors and problems alien to normal production are always encountered in war materiel.

We in this hemisphere are now experiencing a depletion of rich sources of ores bearing metallic elements. Even the vast Mesabi iron deposits are hitting new lows in total iron content of the ore. Nickel deposits in Sudbury are another prime example of diminishing metal content. Technical advances, however, usually can offer solutions in improved smelting practices so low-grade ores can be processed economically. The critical danger occurs when nations find themselves isolated geographically from raw materials and compelled to use stern conservation programs.

Look for Alternates—One of the first efforts of conservation is to require the designer to study all his products and determine which ones can be successfully produced from alternate materials. In steel and allied industries this is a sustained program on the part of both the designer and producer. While the designer is studying alternates, producer research continues toward the development of suitable alternates for materials high in strategic element content.

AISI type 430 stainless steel is currently being used as an alternate in many applications where materials now in short supply were previously used. These substitutions may not be as satisfactory as the more strategic materials. However, this grade is decontrolled and, in many cases, is the most suitable material on the market. A typical example is the substitution of type 430 for the 18-8 chromium-nickel stainless steels.

Screeching Halt—Large quantities of nickel-bearing stainless steels have been used in restaurant equipment. For example: Back bars, table tops, cabinets, trim, steam tables and many other fixtures in the food service line were formerly manufactured from types 302 and 304. When NPA order M80 became effective many of the 18-8 orders for these applications were not permitted to be melted.

As a result manufacturers have changed material specifications to type 430 stainless and are now offering fabricated equipment to the trade. While AISI type 430 is a member of the stainless steel family, it must not be assumed that the material possesses the same working properties as the chromium-nickel steels.

A typical example can be found in the illustrated sink strainer. It was formerly made of type 302 and is now being produced from type 430. Use of type 430 introduced the need for more operations. These include the draw pictured at the left plus extra polishing operations. This solution, while more costly because of additional operations, still offers a successful alternate and permits the manufacturer to market his normal line.

Nickel Saved—Another case of substitution of chromium stainless for nickel-bearing stainless is in certain heat resisting applications where the chromium-nickel grades, such as AISI type 309, have been used in the past. Through redesign, the operating temperatures of oil burners have been reduced to the point where less heat-resistant materials could be substituted and nickel conserved. Also, stressed parts at elevated temperatures have been redesigned, utilizing larger sections, therefore lowering stresses and permitting lower alloy content.

Chromium stainless steels have also been substituted in many cases for chromium plated copper base alloys. For example, some recessed bathroom fixtures were formerly made of copper-nickel-chromium plated brass but are now manufactured from AISI type 430. Besides saving copper base alloys, nickel salts required in plating are

Draw sequence on sink strainer in type 430. One less step is used with type 302. Extra polishing operations were required. Part still cost less than chrome plated brass

Is on Conservation

also unnecessary. Thus a double conservation is effected. Even in the plating of steel, there has been a notable conservation of both copper and nickel salts by eliminating plated parts and using 17 per cent chromium stainless.

Another application is the substitution of type 430 stainless or high nickel alloys in industrial laundry equipment. Large scale replacements have been made, even for Z nickel.

Trim Substitutes—The architectural field has also shown considerable interest in chromium stainless steels. Corrosion resistant stone anchors are now acceptable in type 430 as an alternate for copper and nickel alloys. There have been many architectural substitutions of type 430 for the chromium-nickel grades, particularly in interior trim such as column covers, wainscoting, elevator enclosures and rolled moldings.

Fabricators who have gone to type 430 stainless steel as a replacement for chromium-nickel grades have almost invariably done so with a concession either in corrosion resistance or labor cost. This indicates that the material will be used as a substitute only as long as the nickel shortage lasts. Of course, there will be cases where type 430 will prove satisfactory and economical. In these, manufacturers undoubtedly will continue to produce 17 per cent chromium steel. They, however, probably will be in the minority.

Mass Migration—A peculiar phenomenon of the chromium-nickel 18-8 stainless steels appears when the material is heated in the temperature range of 800 to 1650° F. At these temperatures carbon migrates to the grain boundaries and combines with chromium, thus depleting the chromium content in the adjacent areas, and so lowering the corrosion resistance at these points. The completeness of this reaction is a function of time, but under extremely corrosive conditions it has been found that even welding heat will cause enough harmful carbide precipitation to give unsatisfactory performance.

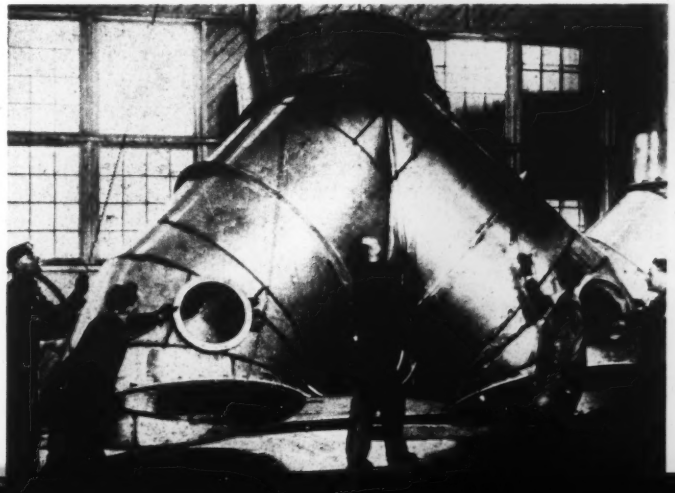
There are two ways of eliminating this precipitation. If the equipment can be annealed at a temperature of about 1950° F after welding, types 304 and 316 will redissolve the carbides that have been formed as a result of welding heat.

A second method of eliminating the chromium carbide formations is to alloy with columbium or titanium. Columbium and titanium replace the chromium in the carbide-forming reaction; therefore the chromium is not depleted in the grain boundary area and corrosive attack due to carbide precipitation is not encountered in these "stabilized" grades.

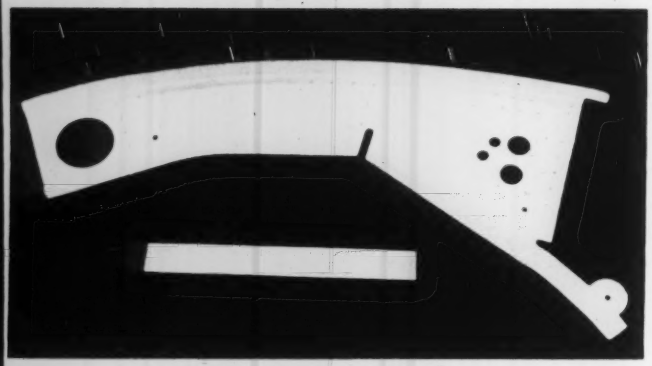
Columbium Economy — Continuing experience by various producers shows that if the carbon content of types 304 and 316 is limited to 0.03 per cent maximum, harmful carbide precipitation will not occur, even in multiple pass welding on plate thicknesses up to $\frac{3}{4}$-inch. This has resulted in tremendous savings of one of the most strategic of materials, columbium.

One ton of metallic columbium content is conserved for every 125 tons of extra low carbon material used in place of columbium stabilized. Since the production of this grade is in the thousands of tons annually, a great many tons of columbium have been diverted to more essential defense uses.

Type 316L welded fitting for paper mill piping. Use of low carbon grade saved columbium and assured fit which might be lost in costly anneal



Successful applications for extra



Aircraft fuselage frame section produced by stretch forming a flanged 17-7PH blank. Holes are punched after heat treatment to insure fit

low carbon grades have been found in the pulp and paper, chemical and food processing industries. Here equipment is large and field erection and welding are usually mandatory. For these reasons the equipment cannot be annealed after the final welding operations.

Notable conservation of columbium has been made in certain installations. Examples: A recent order for chemical plant centrifuges showed a 300-pound columbium saving; a synthetic fiber processing plant saved over 6000 pounds of columbium in a single order for type 316L. The chemical analyses of 304L and 316L are the same as for their standard counterparts, with the exception that the extra low carbon grades are limited in carbon to 0.03 per cent maximum.

Increasing Market—Extra low carbon grades no doubt will be used in increasing quantities where stabilized stainless grades have been purchased because of danger of failure near welds in heavy-duty equipment. Since the extra low carbon grades are 8 to 10 per cent less than stabilized grades in price base their uses should expand tremendously in the future.

Nominal additional charge made for extra low carbon analysis over standard grades is usually less than the cost of annealing and pickling the equipment after welding. Savings effected in price of the metal and columbium conservation should be of value to fabricators and the armed services.

There is one precaution about the extra low carbon grades. Harmful carbide precipitation will not occur as a result of welding, but the material cannot be used for long periods of time in the temperature range of 800 to 1650° F. In such applications a stabilized grade is required to prevent formation of harmful carbides and possible failure due to intergranular corrosion.

Two Examples — Examples of new alloys receiving widespread attention from designers are Armco 17-4 PH and Armco 17-7 PH. The 17-4 PH grade is produced in bar form and the 17-7 PH grade in wire, sheet, strip and plate form.

These grades are metastable austenites which can be transformed to a martensitic structure through a simple heat treatment. Ordinary martensitic grades of stainless steel do not possess the corrosion resistance of the AISI 300 series. These new precipitation-hardening grades bridge the gap between austenitic and martensitic stainless steels. They can be worked with about the same procedures used on austenitic grades and then can be hardened to approximately the levels of martensitic materials. Corrosion resistance is better than standard martensitic stainless steels and closely approaches that of the austenitic 18-8.

Marine Use — One noteworthy conservation of nickel has been made by substituting 17-4 PH bars for naval boat shafts. The material replaced was K-Monel. Substantial amounts of nickel were saved. Also available in cast form, 17-4 PH has been used for marine propellers in place of naval bronzes.

Wire and strip of 17-7 PH are used as a replacement for high copper alloys. Among the first applications for this material were springs and diaphragms to replace beryllium copper.

Other important uses of 17-7 PH sheet and strip are in aircraft manufacture. Since the alloys can be formed in the soft austenitic state and hardened to high levels, lighter parts for airframes can be designed from the material than from hard temper AISI types 301 and 302. Splices and laps in riveted joints are eliminated. It also possesses extremely high strengths at temperatures up to 650° F; so that thinner sections can be used in hot locations throughout the airframe.

It seems obvious that future use of AISI type 430 will depend on a balance of service life and manufacturing cost when type 302 is available again for any use. Expanding markets for extra low carbon grades can be expected both from metal cost and conservation standpoints.

Small Business Aid

Leaflets designed to help small businessmen, one on the technical subject of selecting the right tool steel, and the other, "Is Your Labor Turnover Cost Too High," are now issued by the Small Defense Plants Administration.

"Selecting the Right Tool Steel" explains the different types and alloys of tool steel that are encountered in the machine shop. It discusses the use of carbon steels, high-speed tool steels and many more.

The labor problem booklet outlines a workable method by which the small businessman can estimate what his labor turnover costs are. It also suggests methods for reducing this drain on business efficiency.

Handling Costs Cut in Parts Assembly

All parts handling is done by fork truck and special parts containers. The homemade containers designed for this job are stackable and tierable

Steel fabricator put one fork truck to work and improved parts container design in the assembly plant. Savings: $9152 per year in handling costs

HOW MUCH materials handling equipment would a firm need to save more than $9000 in one year's time?

A Detroit steel fabricator provides a detailed answer to that query as it affects his operation. Putting one fork truck to work and improving parts container design in the parts assembly plant, engineers were able to cut $9152 annually from previous labor handling expense.

Wasted Manpower—In setting up a new parts plant separate from existing facilities the company sought to overcome manpower waste in the component assembly operation. In this department, a four-man crew worked with hand hoist and cranes to unload, store and handle conveyor parts through the various assembly stations. The arrangement was judged slow and inflexible.

As a result, one small-size Baker-Raulang fork truck was placed in service to replace the hand labor. Now, all handling in the new building is performed by this one truck —at the resulting savings in time and labor.

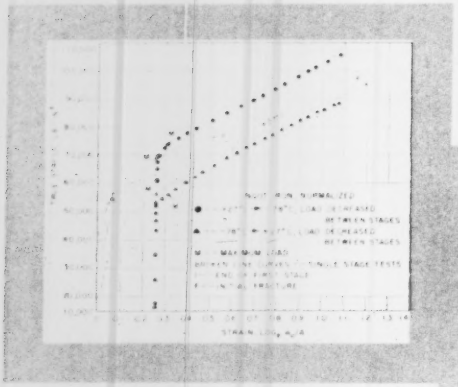
Inaccessible Containers — Another step followed that further increased efficiency of handling and storage. Parts containers in use were difficult to unload at the production tables. In addition, containers were inaccessible, forcing workers to depend entirely on the truck to remove boxes from the stack whenever even a small quantity of parts was needed.

Solution was a homemade hopper with self-unloading feature. Hopper can be fork trucked easily and is not difficult to stack. Containers are employed at both production and work benches. To get most effective results from its truck, the firm requested all suppliers to ship material in trackable boxes or cartons. Now, about 90 per cent of all material received is handled by fork truck without trouble.

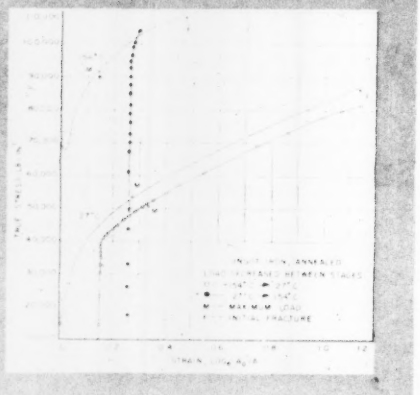
Truck operator feeds parts to workers at assembly benches, positioning self-unloading containers on the tables

Fast Trip — The operation, as finally resolved, sees about 500,000 pounds of parts pass through the small assembly building each month. The fork truck meets highway trucks at the receiving pit, unloads shipments, takes them to storage in half the time required in the old plant.

When parts are needed at production tables, the truck delivers them. As components are assembled, workers place them on pallets near work areas for a fast trip to storage.



Stress-strain values for normalized ingot iron. Circles are values at minus 78° C on specimen previously extended to maximum at plus 27° C. Triangles are values during extension at plus 27° C on specimen previously extended to maximum at minus 78° C. Prior strain temperature history on tensile properties can be determined by comparing curves with broken line ones for single tests



True stress-strain values for annealed ingot iron. Closed circles are values at minus 154° C of specimen extended to maximum at plus 27° C. Open circles represent true stress-strain values obtained during extension at plus 27° C with specimen extended to maximum at minus 154° C. Broken line curves show strain relationship of specimen extended to fracture in single tests

Sub-Zero Strain Aging Affects Iron Properties

True stress-strain relationship of ingot iron extended in tension at minus 120 C definitely affected by strain aging. Brittleness is determined by initial tension

THE WAY metals deform with ultimate failure or fracture depends on a number of factors.

At high temperatures metals creep, at room temperatures different metals vary greatly in ductility at fracture. At sub-zero temperatures, some metals become noticeably embrittled, whereas some steels and certain nonferrous alloys become tougher than at room temperature.

In recent years, several investigations indicated clearly that the true stress-strain relationship for metals and alloys extended in tension depends not only on the instantaneous values of strain, strain rate and test temperature, but also on the previous strain-temperature history of the specimen.

Story on Ingot Irons — Here's what the National Bureau of Standards found out about ingot iron after extending tensile specimens at selected temperatures ranging from minus 196 to plus 100° C, to specified strain values, and subsequently extending them to fracture at different temperatures within the mentioned temperature range:

Strain aging definitely has a pronounced effect on the true stress-strain relationship of ingot iron specimens extended in tension at temperatures as low as minus 120° C. Until now, general opinion was that strain aging of ingot iron is insignificant at sub-zero temperatures.

That rheotropic brittleness of ingot iron depends upon the initial condition of the specimen. For example, cold working of hot rolled or normalized specimens by extension in tension at room temperature removed some of their brittleness at low temperature, whereas similar cold working of annealed specimens increased their low temperature brittleness.

Previous Findings—Recently, investigators had reported that part of the brittleness in steels and other metals at low temperatures could be removed by cold work at temperatures above that of the transition range from ductile to brittle behavior. Such brittleness had been termed rheotropic, and a large part of the deficiency in ductility of annealed steels and some other metals at low temperatures had been reported to be rheotropic.

On the basis of processing and previous heat treatment, the ingot iron samples studied by NBS could be classified as annealed, hot-rolled, quenched and tempered, normalized, or cold-drawn. They were all machined into cylindrical tensile specimens and extended in tension to specified strain values in a pendulum-type hydraulic testing machine of 50,000 pounds capacity.

While undergoing deformation, the specimens were kept completely submerged in a liquid bath maintained at the desired temperature, except in those tests made at room temperature.

Extended Twice—The specimens were first extended at selected temperatures ranging from minus 196 to plus 100° C. After an interval

of about ½-hour, they were again extended—this time to fracture—at a different temperature within the same range.

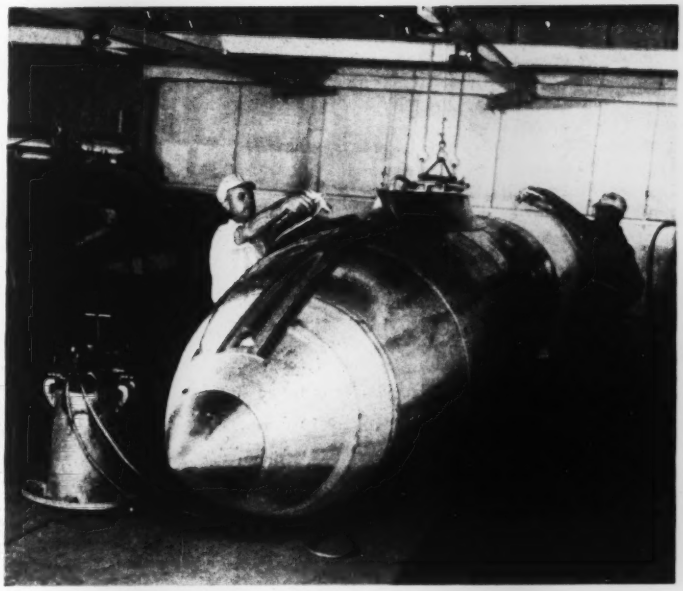
During the interval between the two stages of each test, the specimen was maintained at the lower temperature in order to minimize any strain aging of the iron during this period. Simultaneous load and diameter measurements were made throughout the course of each stage of deformation, and true stress-strain curves were plotted from these data.

The deviation of the true stress-strain curve for the second stage of the tension tests from the true stress-strain curve for a single-stage test at the same temperature as that used in the second stage gave a measure of the effect of the strain-temperature history during the first stage of the test on metal's tensile properties.

The Determining Factors — For ingot-iron specimens extended in tension in the temperature range studied, the total work hardening (increase in true stress with true strain) is mainly the resultant of the two processes known as strain hardening and strain aging. Strain hardening is caused by crystal deformation and increases as the testing temperature is lowered. Strain aging, on the other hand, is generally associated with the precipitation of an element from solid solution and increases (within limits) with rise in temperature.

The work hardening of ingot iron during deformation in tension at temperatures below minus 120° C is mainly strain hardening; thus at these temperatures the total work hardening increases with lowering of the temperature. However, as the testing temperature is raised above minus 120° C, the strain aging during the deformation of the specimen increases sufficiently to become a dominating factor, and the work hardening then increases with increase in testing temperature.

The relative proportions of strain aging and strain hardening at the various temperatures for the five conditions of the ingot iron were determined on the basis of the known tendencies of these two types of work hardening to increase or decrease with temperature.



After final assembly, aircraft external fuel tanks are coated with special compound by painters in this pressure-ventilated and heated spray booth

Slip Covers for Fuel Tanks

Air resistance of aircraft external fuel tanks is greatly reduced by a coating of zinc chromate solution and a synthetic rubber-base compound

THE MAN who coaxes the top few miles-per-hour from today's fast combat airplanes may not be an engineer or an aerodynamicist, but a painter. High speed paint, designed to cover tiny surface variations with a smooth aerodynamic film, is pushing up jet aircraft speeds.

Ryan Aeronautical Co., San Diego, Calif., is adapting this development in the production of huge external fuel tanks for aircraft. These containers are given an exacting surface preparation which reduces their air resistance and adds to their protection against the elements. With this streamlining plus design, patterned after a wing foil section, the tanks can "keep up" with the speediest planes.

Slippery Skin—First step in giving the tanks a slippery skin begins after final assembly and inspection. They are suspended in a large pressure-ventilated paint spray booth, from overhead monorail conveyors. Attachment is made by connectors which attach to the tank strut fittings. Thinner and alcoholic phosphoric acid solution are used to clean and to etch slightly the aluminum alloy surfaces to provide good adherence for the primer. A coat of zinc chromate solution, which grips the metal and provides a slightly acid base for the next coat, is sprayed on. After a few minutes drying time, a special synthetic rubber-base compound is sprayed on.

Formulated for its aerodynamic advantages, the compound also resists attack by aromatic fuels. It is rain erosion-proof at high speeds. This is an important characteristic because, at near-sonic

speeds, rain drops can hammer painted surfaces with the destructiveness of small bullets. This attack has been known to remove ordinary paint as effectively as a desert sand storm.

Resins "Poisoned" — The preparation must be mixed immediately prior to its application and cannot be stored, even for a few hours, after mixing. It contains powdered aluminum which "poisons" the resins in the solvent within a short time after it comes into contact with them. This causes them to jell and become extremely viscous.

As the aluminum flakes dissolve, they react with the resins to produce quantities of hydrogen gas which would accumulate excessive pressure in a closed container. A special mixing technique is employed to insure that the tiny aluminum flakes spread out in the resins and lie as flat as possible.

After spraying, the tanks are rolled out of the spray booth on monorail conveyors into the final assembly building. They are wet-sanded and hand-rubbed until the finish is perfectly smooth. Instructions and fitting locations are stenciled on with vinyl lacquer—only paint which seems to adhere to the compound.

"Electronic Brain" Makes Ore Mining Easier

RAW MATERIAL extracting industries may benefit greatly by development of a new and improved electronic "brain" by the Goodyear Aircraft Corp., Akron.

The new "thinking machine," an electronic differential analyzer, promises to help operators overcome inefficiencies in extracting ores, oil and gas from the earth. Through analytical studies of production procedures, it is also able to show where machines and operating techniques can be improved.

Many Uses—To date, the analyzer has been used mostly for classified work under government contract. But the newer version was built by Goodyear as a commercial product to permit its use in a variety of fields.

Usefulness of the machine is evident not only to electronic experts but to industrialists as well. In a general sense, the analyzer is an outsized slide rule and, as such, constitutes an answer to the critical shortage of engineers in all fields.

With its ability to determine the solution to problems of higher mathematics in a matter of minutes, the analyzer permits engineering specialists to devote more time to advanced phases of their research and development activities.

Figures or Simulates—It is capable of solving problems of motion and control, either by direct simulation or by mathematical equations, covering a multitude of fields ranging from questions dealing with flight in solar space to the measurements of a baseball's curve.

The analyzer solves problems in terms of voltages and wave forms, which are transcribed onto paper in allied recording machines, and interpreted by trained technicians. Problems of direct simulation are answered through a study of electrical and mechanical circuits. By substituting different voltages in the analyzer for the different parts of an equation, any problem of motion that can be translated into a mathematical equation can be solved.

New Ideas Tested—The Goodyear analyzer also encourages advanced thinking and inventive processes through its ability to test the workability of new ideas.

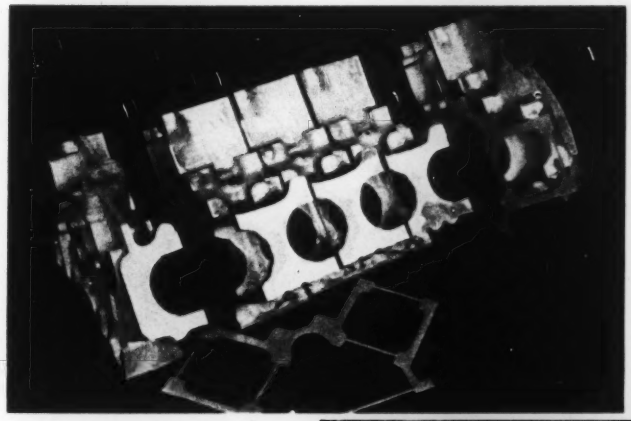
Smaller and more compact than the usual computer unit, analyzer looks like an ultra-modern, streamlined telephone switchboard. It is operated entirely from the front. The control panel is sloped for easy reading of dials and indicators.

Field: Unlimited—Uses for the machine have already been found in the textile and automotive fields. Evident is its ability to find the answer to complex engineering problems in the fields of heavy construction, mining, petroleum recovery, transportation and in the field of atomic research and development.

ENGINE BLOCKS:

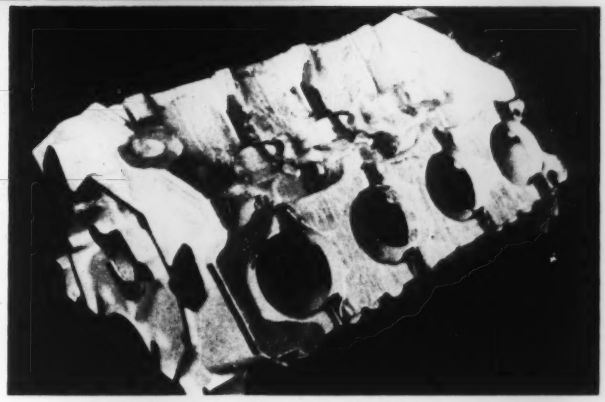
ALUMINUM ENGINE BLOCKS of four, six and eight cylinders made from the same three castings? It's neither impossible nor improbable—they're doing it at the Cleveland Development Division of Aluminum Co. of America. It's also being investigated by several automakers.

How do they do it? The answer is furnace brazing of component aluminum castings. These castings are of only three kinds. One is the front end, one the rear and



Exploded view of V-8 engine block shows integral sections and brazing sheet in place

After furnace brazing integral parts form complete unit. Block is ready for machining



Development division engineer Paul Crane assembles sandwich for furnace braze

Sandwiched from Simple Castings

Complicated castings can be broken down into simple components, then furnace brazed to form the finished part. Use of the method on aluminum engine blocks is promising

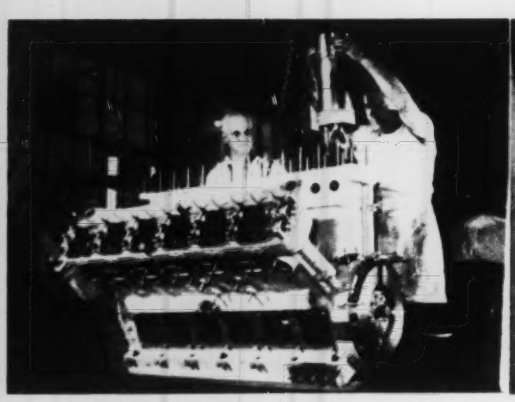
the third is the middle section.

When requirements are for an engine with six cylinders, they put in one of each of the end castings and two of the middle pieces. If the call is for eight cylinders, another middle section is added to the pile.

Furnace Tolerance — Between each section of the assembly is a gasket-like piece of brazing alloy which has been fluxed. This material has about 12 per cent silicon and as a result melts at a lower temperature than does the parent material. Note here that the furnace requirements call for control within 5° F plus or minus. Critical melting range of the brazing alloy is between 1080 and 1085° F.

Company engineers recommend a gas-fired convection furnace. In production the component parts would be stacked together with the gasket of brazing alloy in between them. Weight of the castings is often enough to hold the parts in place and use of only simple jigging fixtures is required.

Used Elsewhere—Brazing method is same in principle as that in use for several years on other products. One manufacturer uses a forged shell for one part of an automatic transmission unit and brazes the cast parts in place. Fatigue tests show that in almost all cases failure occurs in the parent material and not in the brazed joint. Same method is being tried on cylinder heads (STEEL May 19, 1952 p. 95).



Aluminum cylinder block for Packard's in-line six marine diesel is turned on its side for machining cavities in which removable cylinder linings and heads will be seated

In goes the heart—complete assembly, including cylinder head and liner, valves, fuel injector, piston and connecting rod, is lowered into the V-12 block as one piece

Diesels Come Back with a Roar

Family of four engines revealed by Packard to make strong comeback in marine, industrial and commercial fields. High interchangeability "sold" the Navy $90 million worth

SOME 30 years ago Packard Motor Car Co. took a flier with a diesel engine. It made what was said to be the first aircraft diesel. Since then, however, its interests have been in gasoline powered engines, and recently in jets.

The diesel came back for Packard with a roar after the firm developed a family of four engines with high interchangeability of parts and "sold" their worth to the Navy. A $90 million contract from the Navy for these marine diesels followed.

Aims Are High—Output is currently taken up by the defense order, but this will not always be the case, so Packard is aiming at reentering the marine engine field in a big way. It believes, furthermore, that these new engines, designated series 142, also are going to make a big noise for themselves in other industrial and commercial applications. Trucks, busses and off-the-highway vehicles may be some of these.

There are several features which set these engines apart from other diesels. Outstanding is the fact that they embody an all-aluminum structure. Besides the cylinder block and integral crankcase, the oil pan, valve covers, timing gear cover, supercharger, intake and exhaust manifolds, pistons and other miscellaneous parts are of aluminum. Result is that the engines have the lowest weight-to-horsepower ratio of any diesel currently in production and a total weight far less than other diesels of a comparable horsepower.

The two models presently manufactured are an in-line six weighing 2200 pounds and developing 300 brake-horsepower at 2000 rpm and a V-12 weighing 3250 pounds and putting out 600 bhp. Later an in-line eight, developing 400 bhp, and a V-16 of 800 bhp may be added. All ratings are cited with superchargers.

Parts Interchangeable — All these engines will have much in common. One basic cylinder design is used in each. This cylinder is of 142-cu in. displacement, with a bore of 5⅝-inch and stroke of 6½-inch. Compression ratio is 15 to 1.

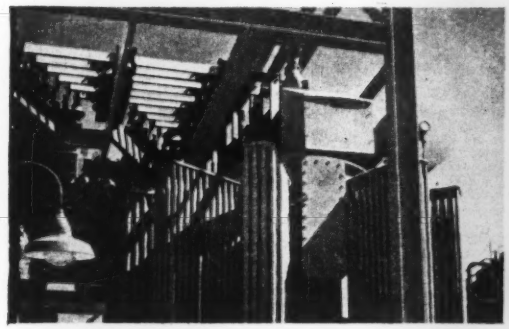
This interchangeability also carries over to pistons, wrist pins, intake and exhaust valves, valve springs and guides, main and camshaft bearings, fuel injectors and fuel pumps and several other parts. Even the crankshaft on the six and V-12 is completely interchangeable.

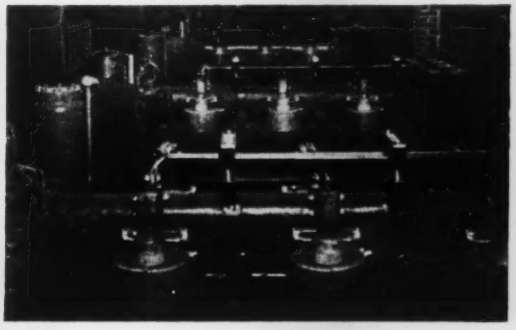
Heart of the engine is a unique cylinder head. Precision-cast in alloy steel by the investment process, it contains a spherical precombustion chamber into which is fed, by a pintle-type fuel injector, metered quantities of fuel. This chamber is centered over the piston and the hot gases from it are directed through a removable multiple orifice burner, impinging on a dispersing cone on the piston's dome to give the fuel-air mixture high turbulence for clean burning. Also within the head are four valves, two intake and two exhaust, opened by individual camshafts. Exhaust valves are sodium cooled and all are Stellite faced and seated in Stellite rings.

One Piece Assembly—The entire unit is self-contained and in manufacture is welded to the wet-type cylinder liner to make an easily replaceable one-piece assembly. This fits into the cylinder block and is held in place with a threaded plug.

A five-ring permanent molded aluminum piston operates in the cylinder. Lubrication of the wall and wrist pin is by splash feed.

It takes a Lot of Copper to make a Lot of Chemicals!





These photographs show a lot of copper bus bar in a new plant of a great chemical company, whose name and location cannot be disclosed. The copper carries heavy currents to electro-chemical equipment for the production of valuable products used in national defense and in industry. Revere furnished 325,000 pounds of bus bar for this service, the bar going into substations, rectifier stations, and cell houses. In addition, at the time of installation the Revere Technical Advisory Service collaborated with the customer in working out some difficult details in the design of switches. If you need electrical conductors, remember that copper has the highest electrical conductivity of all the commercial metals, that Revere makes bus bar, and that the Revere Technical Advisory Service is always ready to work with you on any problem concerning copper and its alloys or aluminum alloys. Call the nearest Revere Sales Office.

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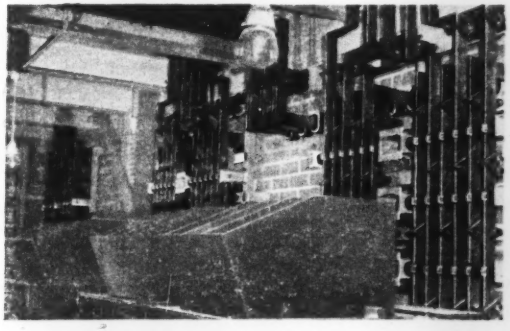
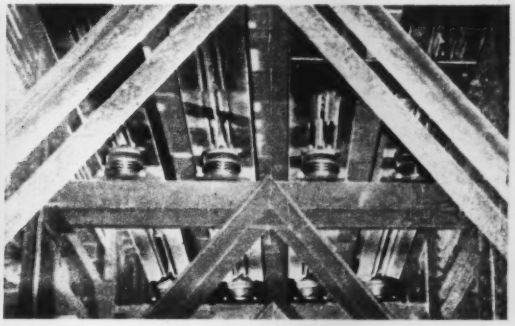




Bearings and other points are pressure lubricated.

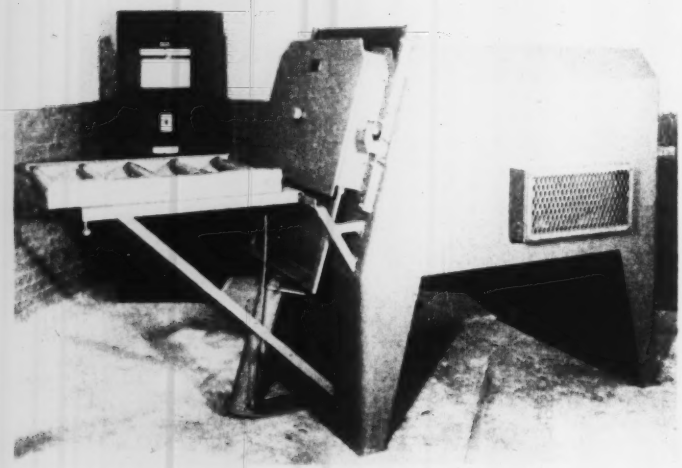
The crankshaft, an alloy steel drop forging, has seven bearings. Main bearings are of the silver-coated, steel-backed type, overlayed with lead and tin for scuff and corrosion protection.

Engines Well Cooled — The engine is fresh-water cooled, using sea water type heat exchangers. Because the supercharger operates on hot exhaust gases, the aluminum exhaust manifold contains a stainless steel tube and, as insulation, a dead-air space between the tube and the manifold casting. The manifold itself is water jacketed to reduce heat radiation.

Air motor starters are used by the Navy to effect quick starting under cold weather conditions, but electric starters could be used.

How many of these engines are required per ship is not being disclosed by the Navy at present. Neither are the types of ships equipped with these engines made public. A major use is for minesweepers and it is known that the engines not only provide the power for the screws but also for auxiliary devices.

Manufacture of the engines is centered in a building adjacent to Packard's main plant on Grand Blvd. in Detroit, formerly used as a parts depot.



PLATING OR PAINTING WITHOUT PICKLING

protected atmosphere does the trick

Furnace Eliminates Second-Operation Cleaning

BRIGHT scale-free tempering and controlled oxidation tempering from 400 to 1400 F are made possible by a sealed, controlled atmosphere furnace manufactured by Ipsen Industries, Rockford, Ill. The D-300 tempering unit utilizes a new process of controlled oxidation recently developed by the Ipsen research staff.

Formerly bright or controlled oxidation was not important, since a heavier scale had already been formed on the piece at higher temperatures during the heat treating cycle and a cleaning or pickling operation was necessary. With the development by the company of bright, scale-free heat treating, cleaning operations can be eliminated resulting in savings in both time and money by using bright or controlled oxidation tempering.

Smooth Surface—A protective atmosphere is supplied to the D-300 unit during the entire bright tempering cycle. After sufficient time at temperature, the load is cooled in the furnace until it reaches about 400 F. The bright scale-free work is then cooled enough to be removed from the furnace without danger of oxidation. Cleaning or pickling are not required before plating or painting.

A controlled oxide coating, often desired to reduce corrosion or wear and to produce an attractive blue-gray or blue-black appearance, can also be produced in the unit. The job is done either in a separate operation or concurrently with tempering or annealing.

Exact Control—Protective atmosphere is used to maintain a bright surface during any necessary tempering or annealing operations prior to the controlled oxidation cycle. Thus it is possible to maintain strict control over the oxidation process irrespective of the tempering or annealing portions of the cycle.

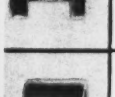
After the load heats or cools to the oxidation temperature, flow of protective gas is discontinued and a predetermined quantity of water is introduced into the unit for a specified period. Work then is removed from the furnace and air-cooled or liquid quenched.

Just Enough—During either air or quench cooling, further oxidation is prevented by the controlled oxide coating. The air-cooling process produces a blue-gray coating and the oil quench a darker blue-black finish resulting from oil penetration into the oxide film. Either soluble or standard quenching oil may be used.

Ease in maintaining uniform temperature makes the unit well suited for use in nonferrous tempering. Sensitivity of these metals to temperature differences and the need for tempering close to the melting point of some of the softer metals makes uniformity essential. Solution heat treatment of aluminum, copper and brass annealing and precipitation or solution heat treatment of beryllium copper are a few nonferrous applications.

Don't Excavate—Floor mounting eliminates pits and simplifies installation. Piping and wiring require only simple connections.

Welded gas-tight frame and flat, ground door frame and door plate practically eliminate leakage problems. Door construction and air-draulic lifting mechanism are the same as used on company's other automatic heat treating units.

	19 1⅛" – 2⅜"	14.0 MIN. (Hand Screw Machine)	9.5 MIN.
	32 1" – 2⅜"	5.0 MIN. (Old Style S. S. Automatic	3.7 MIN.
	12 2½" DIA.	15.0 MIN. (Hand Screw Machine)	5.4 MIN.
	5 2½" LONG	20.2 MIN. (Hand Screw Machine)	12.0 MIN.
	16 1⅜₁₆" – 2⅞₁₆"	11.0 MIN. (Hand Screw Machine)	7.0 MIN.
	10 2" DIA.	7.5 MIN. (Hand Screw Machine)	3.2 MIN.
	16 4¼" LONG	27.0 MIN. (Hand Screw Machine)	12.5 MIN.

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IN THE BIN...FOR THE
COST OF 100!

The Acme-Gridley Model M Single Spindle Automatic Bar Machine cuts costs on small-lot work—and speeds production, too.

That's the customer-documented experience of The Elliott Company, in their Springfield, Ohio plant. The figures in the table above are their own—as is the statement of cost saving. They further state that these savings will recover cost of the machine in three years.

Notice the wide variety of parts, and the uniformly faster machining times on each—an average production increase of 87%. But faster production and versatility are only part of the story. Additional savings—in machine and tool investment, in floor space, in man hours—go to make up the five-to-one reduction in production costs realized by The Elliott Co.

All of these are the direct results of inherent design features of the Model M: wide, open tooling zones, for easy access; heavy, rigid frame construction, to permit the use of carbide tools; simple camming, for quick change-over; three automatic spindle speed ranges, for most efficient cutting; independent camming for the eight tool slides, to permit combining cuts—these and many more.

Learn about them in Bulletin M-50, your guide to lower machining costs on small-lot work.

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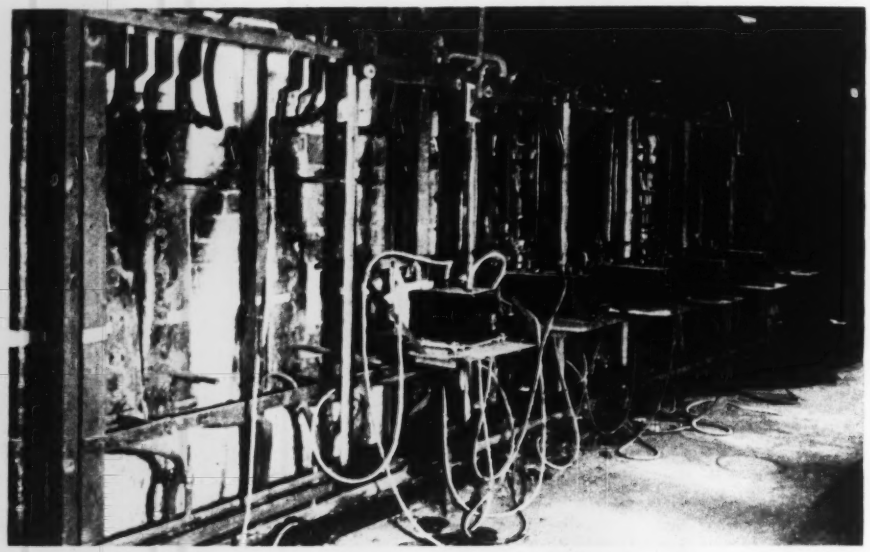

Oil-fired furnace equipped with modern total radiation-type pyrometers

Luminous Flame Increases Heat Transfer

Full scale furnace tests at Holland steel plant disclose that steam employed for atomizing fuel oil lowers peak radiation of flame and extends peak further from burner

SINCE early 1949 work has been in progress on an experimental furnace made available by the Royal Netherlands Steelworks, Ijmuiden, Holland, for the purpose of studying the mechanism of luminous flame radiation. This work is being carried out by scientists and engineers from France, Holland, Sweden, United Kingdom and the United States.

A furnace designer can predict with fair accuracy nonluminous radiation, because it arises almost entirely from CO_2 and H_2O which are the products of complete combustion. But if low emissivity resulting from a nonluminous flame is not satisfactory, the heat transfer may be increased by developing a luminous flame, that is, a diffusion flame containing carbon particles due to a combustion and thermal cracking and to incomplete combustion. The main difficulty is that since radiation is given out during the process of combustion it is dependent on the rate at which combustion is taking place, and this can only be studied experimentally in the conditions of a full-scale furnace.

How Results Are Obtained—In practice the furnace designer will use his experience with the particular fuel and conditions prevailing and will multiply his estimate of nonluminous radiation by perhaps two or three to allow for luminous radiation and will reach a result accurate enough for his initial purpose. But if he wishes to know the effect, for example, of changing to a different fuel or changing the method of introduction of the air, he is without any information and is certainly unable to specify the conditions which will make the greatest possible use of luminous radiation. It is the object of the present work at Ijmuiden to enable him to accomplish this.

Detailed results of the 48 performance trials of oil fuels thus far completed in Holland are as follows:

1. Oil gives a flame with the peak radiation 17 per cent lower than 50:50 creosote pitch, 7 per cent narrower and with the peak radiation further from the burner. The gas exit temperature and the

Banish the "Bite"

ON PICKLING AND PLATING EQUIPMENT

with these NATIONAL (TRADE-MARK) CARBON AND GRAPHITE AND KARBATE (BRAND) IMPERVIOUS GRAPHITE PRODUCTS

Pickling and tinning are messy, expensive – and *necessary*. However, you can *greatly reduce* equipment maintenance costs and improve plant housekeeping by making full use of these National Carbon products wherever service is dirty and tough. As is well known by manufacturers of your pickling and plating *solutions*, only carbon and graphite and impervious graphite withstand the "bite" of so wide a range of corrosive chemicals.

HERE'S WHERE THEY'RE USED:

STAINLESS PICKLING

Carbon brick tank linings with "Karbate" Plate-Type Heat Exchangers and drain lines offer powerful resistance to nitric-hydrofluoric solutions.

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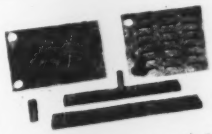
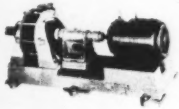


Graphite Anodes, either alone or in combination with dissolving-type anodes, are non-contaminating and long lasting.

Various immersion-type and shell-and-tube type "Karbate" Heat Exchangers are available to suit capacity requirements.

CARBON STEEL PICKLING



"Karbate" pumps and piping resist sulphuric and hydrochloric acid attack . . . protect solution from contamination.

"Karbate" Shell-and-Tube Heat Exchangers are often most economical where more than 50 square feet of heat transfer surface is required.

Graphite Tank Rolls provide an ideal combination of good electrical conductivity and resistance to acid attack in electrolytic pickling operations.

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no skin sores, no rancid odors

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which can be handled bare-handed

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less than 8¢ a gal., in the machine

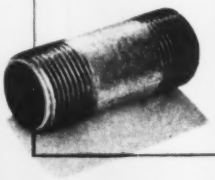
YOU GET THEM ALL WITH

ANTISEP
ALL-PURPOSE

ANTISEP doubles tool life for Portland manufacturer —at 1/5 the cost of oil!

Operation consists of forming, threading and tapping stainless steel pipe nipples from 316, 340 and 303 type steel. This company switched from straight oil—costing 42¢ per gallon—to Antisep A P. Base mixed one part to 30 with water—at a cost of about 8¢ per gallon.

LATEST REPORT—"Getting better finish—tool life doubled—at 1/5 the cost of oil formerly used." Their operators also like Antisep because there's no smoke and work comes off clean.



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Revision Boosts Nut Blank Production

After rejuvenating their Budd-Ranney automatic bar machines, Miller Glass Engineering Co. have substantial gains to report. Old figures in the nut blank production have been upped from 20 to 50 per cent. Revision consists of conversion to hydraulic feed and tooling and electric solenoid timing

temperatures at the tail of the flame are 50 degrees or more hotter with oil than with creosote pitch, and the creosote pitch flame has a considerably higher emissivity than the oil. These effects of emissivity and temperature at the tail of the flame offset each other so that the total radiation is the same.

2. An increase of 39 per cent in the fuel quantity gives a flame which is 6 per cent wider, longer and more intense, the peak radiation being increased by 8 per cent, while the distance is increased 16 per cent.

3. The use of steam as an atomizing agent gave a peak radiation 11 per cent lower than when air was used, and the peak was 10 per cent further from the burner. This was due to the peak flame temperature being developed later and being 11 per cent lower in the case of steam. No difference in flame emissivity occurred with this variable and there were no significant effects at the tail of the flame in radiation temperature or emissivity.

4. An increase of 20 per cent in quantity of atomizing agent gave a radiation which was lower at the tail of the flame (11 per cent lower 3 meters from the burner) whereas the effect on the radiation in the early part of the flame was comparatively small. The lower radiation with increased atomizing agent quantity in the tail of the flame was due rather to lower flame emissivity than to lower temperature. These effects are independent of the type of atomizing agent.

5. An increase of 25 per cent in the combustion air quantity gives a lower radiation at the tail (12 per cent lower 3 meters from the burner). The waste gas temperature is also lower and the difference in tail radiation is due rather to a lowering of temperature than to a change of emissivity.

An examination of these results indicates that the radiation in the early part of the flame is mainly affected by the qualitative variables, i.e. by a change of fuel and a change from air to steam as atomizing agent, whereas the tail of the flame is mainly affected by the three quantitative variables: Quantity of fuel, quantity of atomizing agent and quantity of combustion air. This indicates that the radiation in the early part of the flame depends mainly on the rapidity of the ignition of the given fuel and the dilution of the fuel which affects the theoretical combustion temperature. Creosote pitch presumably obtains more rapid ignition from its creosote constituent and higher emissivity from the pitch.

Reduces Emissivity—At the tail of the flame there has been time for a considerable loss of heat from the flame to the surroundings so that its temperature is largely governed by the fuel input rate and by the quantity of excess air which by this point can enter and dilute the flame. The main effect of increasing the quantity of atomizing agent is to increase the momentum of the jet and hence increase the power of the jet to entrain air, which accelerates combustion in the latter part of the flame and thus reduces the emissivity by consuming the soot more rapidly.

Another way of presenting the results which is of value to furnace designers is to give the mean radiation from the flame, the mean temperature and calculated emissivity as functions of distance from the burner together with the spread in these values to be expected from varying one variable over the range used in the trials, while others are fixed. Results in this form can be used roughly for predicting the radiation from flames within the conditions used in these trials.

During the course of the experiments with oil fuels new facts have been established which may lead to the establishment of a rational basis of oil burner design. The general conclusion is that though there may be small differences between the burners tested, they are unimportant compared with the effects of varying the quantities of atomizing agents.

Worm Gearing for Plug Valves

Valve Division, American Car & Foundry Co., Detroit, reports it is using double enveloping worm gearing on many of its larger size lubricated plug valves, both in semi-steel and in carbon steel.

Gears are made by Cone-Drive Gears Division, Michigan Tool Co., Detroit. Units are enclosed in a specially designed sealed housing, filled with lubricant. The gears are standard on ACF 400-pound class, carbon steel valves with full round opening ports in size 4, 6 and 8 inches.

HUMAN ENGINEERING

(Continued from page 56)

uniformity of action between the different units. Grievances and employee requests have to be settled on substantially the same basis. Men in one plant want to feel they are getting just as fair treatment as those in another location.

It is a really tough job to build a good personnel organization in a single plant. Expanding it to several plants becomes just that much more of a task, involving not only the finding of men with potential for personnel work, but also the tedious work of training them.

Q: Of what nature are most employee grievances these days that you have to settle?

There are very few that I have to settle myself, but the interesting thing is that most of the grievances arising in our plants today are of the same nature that we ran into back in 1933 and 1934, when I first started in this work. In hot weather, requests still pile up for electric fans. There are always many employees who don't like night work and want day jobs. There are always employees and this is a good thing—who want to move along to better jobs and are asking how they can win a promotion or why another employee received a promotion instead of them. Then, in a rapidly expanding company, there is the usual shortage of lockers and complaints over not having them.

Those are the usual grievances we have to deal with. We're thankful we have very few grievances over wages, working conditions, or supervisory treatment. Our standard grievances are not numerous at all and the basic bread-and-butter conditions of the plant seem to be regarded by our people as very good.

Q: Could you suggest how a smaller company with perhaps limited funds could make a start toward bettering its industrial relations?

The first step in any human relations program starts with the president. In our company, President Fred Crawford set the example. So, in a small company, it must be the president who sparks the effort. He must be filled with a zeal to see that people are treated fairly and with dignity. Soon the rest of the supervisory organization begins to do things the way he wants to have them done—the way he insists they be done.

> ***"...a tough job finding men with potential for personnel work"***

Probably within every company there is some particularly qualified individual in the ranks of management in whom the people of the plant generally have confidence and respect. The second step is to find this individual and charge him with the personnel or human relations function.

You can prepare him for his new work by sending him to some of the numerous and fine conferences held around the country in personnel relations, where he can obtain background. From that point on, he just picks up on his own. He begins to build his employment function and the other principal elements of a personnel department including safety and workmen's compensation; employee social, recreational and charitable activities; the field of collective bargaining and adjustment of grievances, and finally, the leading and forming of employee opinion which is actually the communications part of the program.

Q. Is it possible to draw up a budget for industrial relations costs based on a percentage of a company's total sales?

No. You have to appraise your situation on an individual basis. After you've done that, then you can relate it to sales. But you're only deceiving yourself, because if sales fall off you'll still find that there are numerous functions that still have to be performed and you can't reduce the industrial relations budget proportionately.

Q: Have you developed any program of economic education for your supervisory personnel?

Oh, yes. Ever since 1934 we've been passing economic information along to our supervisory organization and to our employees, both in formal programs and also through meetings and through printed material.

There are two ways of increasing economic information within a company. One is the method of teaching economics generally. The second way is to teach economics by explaining situations arising in your own company and how the economic laws apply to these situations. We've always taught the business of Thompson Products, and the economics affecting us, including government.

Q: Can you describe the purpose and function of your personnel supervisors?

The personnel supervisor has his office right out in the working area and he is actually a personnel manager, operating by proxy in that area. It's an effort to move the personnel function out into the plant rather than to have it in a front office remote from where the work goes on.

As to functions, the personnel supervisor first gives expert advice to the foremen and supervisors in his operating area on questions of policy and procedure when unusual or perplexing cases come up. The second part of the personnel supervisor's job is that he is constantly in contact with employees of his area by walking in and out among the machines, making explanations, answering questions and working with employees on social and athletic events. By being a pedestrian he's in a position to catch quickly and straighten out any grievances or injustices that may possibly arise. Employees who constantly see him gradually acquire confidence in him and take to him questions they want answered. He's a catalyst to the

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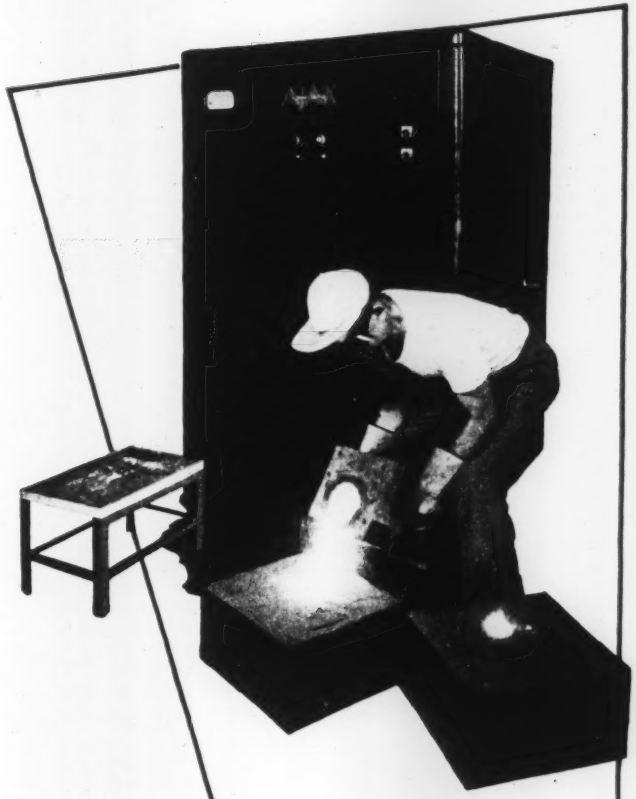

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firm's whole personnel program.

I remember that in my early days (1934) when we had 500 people in the plant I knew every one of them by name, and knew them very well. When we grew to 1000 I knew most of them, but when we got up to about 1500 I felt that the number was too large for me to be personally effective. To maintain close personal contact, which is so important, we decided to have a personnel supervisor on the floor, always in a position to work with the foremen and employees in making sure that company policy was being followed and the whole spirit of our personnel program was in full effect. The supervisor has 1000 to 1500 under his direction.

Incidentally, most of our personnel supervisors are men who formerly worked on machines themselves.

Q: We understand Thompson Products has done some pioneering in the use of exit-interviews. Can you review this?

Our efforts in this field have not been unusual or remarkable. We just make it a point to talk with everybody who leaves the company and get their opinion of the company and any advice they care to give us. Occasionally, we learn of conditions in the plant that we didn't know existed, and this gives us a chance to try to correct them, if necessary. That's not often, however.

Q: Do your hourly-rated employees participate in stock ownership to any extent, and do you encourage their doing so?

Only relatively few of our employees own Thompson stock, although there's a surprising amount of interest in acquiring some. We're reluctant as a company to directly encourage employees to purchase stock, but we're happy when they do buy in modest amounts.

My own personal hope is that some day every employee will of his own volition buy at least one share of stock so that he gets his chance to vote at the annual stockholders' meetings for the officers of the company and so that he understands the dividend that's paid on each share of our common stock, and gets exactly the same reports that all the rest of the stockholders receive.

Q: Will you explain the purpose and context of your annual report of operations for employees?

Yes. In my opinion the greatest single source of labor unrest and suspicion is the erroneous belief held by too many people that of the money a company has to divide at the end of a year, the stockholders get the cream and the workers get the skimmed milk. Our annual report, published for employees since 1938, takes the total money that the company receives during the year for the sale of its parts and services and breaks it down as to where it goes. We show first the necessary bills we have to pay, such as taxes, materials, provision for depreciation and other expenses such as light, heat, telephone, telegraph and miscellaneous. These are all expenses over which we have little or no control. Now, when we take those amounts from the total received, we have left the money remaining to be divided between those who have done the work, those who have invested in the business, and to be plowed back as seed money for the future of the business.

> ***"... collective bargaining in its intended sense is aborted today"***

For the last several years the mony available for these three categories has gone 90% to employees, about 3% to dividends and 7% plowed back. This has completely dispelled any notion among our people that the company's division of available income is unfair. Interestingly enough, too, the split of available income in Thompson Products is about the same as in industry throughout the United States, as reported by Department of Commerce figures.

I am sure that any company misses a big bet when it fails to tell its people how available income is being divided.

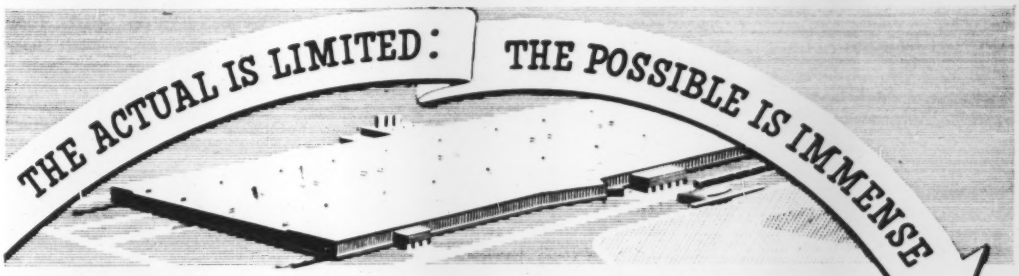
Q: When you install new, automatic, labor-saving, or rather "labor-serving" equipment, do you try to explain its function to operators so that its production economies may be realized the fullest?

Surely. Almost all our employees understand that we can make jobs secure and build opportunities for promotion only by getting our costs down, and thereby causing Thompson to grow. We try to encourage the same attitude on the part of the employee toward his machine as the early frontiersman had toward his rifle or the musician toward his instrument. The machine makes it possible for each of our men to earn his living and, by doing a better job at less cost, to enhance his job security and improve chances for promotion.

Q: What do you think about the necessity for federal legislation against union monopolies and against industry-wide bargaining?

Collective bargaining in its intended sense has been aborted today. The original idea of collective bargaining was a group of honest workmen sitting down with an honest management within the four walls of a local establishment to talk about the ways and means to make that business bigger and stronger so there would be more for all. In most cases today that concept has been completely abandoned, and we have giant labor monopolies with orders crackling from union offices in Washington or Chicago or Pittsburgh to "do this" or "do that". The original idea has been completely lost.

I feel very definitely that bargaining should be returned to the local level and I think the only way that can be achieved is to apply the



NEW LINCOLN PLANT CREATED BY INCENTIVE INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

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WELDED DESIGN INCREASES RIGIDITY WITHOUT INCREASING COST

By **Eric Hartmann,** Experimental Research Engineer
The Porter Cable Machine Co., Syracuse, New York

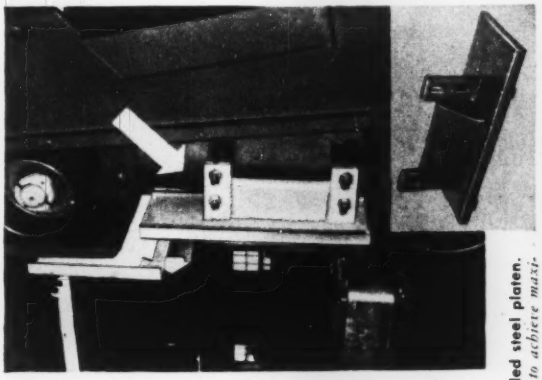

Fig. 3–Detail of Column *on Porter Cable BG-8 Grinder. Shows assembly of belt platen support governing the ultimate accuracy and efficiency of the machine.*

Inset: Rear view of welded steel platen. *Shows efficient use of steel to achieve maximum strength and rigidity per pound of metal.*

BY changing over the design of our belt platen support to welded steel construction, we have cut deflection over 90%. The former cast construction, (Fig. 1) would deflect from .017" to .020" under 400 pound table pressure. The present welded steel design deflects only .0015" to .002"...10% of its original value.

Since steel is 2½ times more rigid than gray iron, it was possible to develop a more efficient product design on the platen itself without changing the basic dimensions of the machine or without increasing costs. On machine tools like ours, rigidity is basically important as it directly affects ultimate accuracy and efficient operation of the equipment.

WELDED DESIGN ALWAYS SAVES STEEL AND LOWERS COST

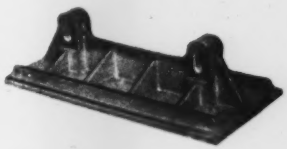

Fig. 1—Former Design—*Belt platen support for grinder was originally a casting. Required machining operations to finish the front face and the mounting arms.*

Fig. 2—Present Design in Welded Steel—*Is simpler to fabricate than the original construction. Components are pre-machined prior to welded assembly to simplify manufacture.*

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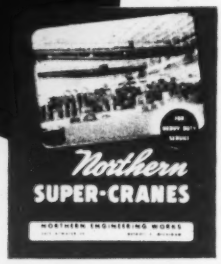

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same anti-monopolistic principles of law to the giant labor trusts as have been applied to industrial trusts.

Another thing — compulsory union membership will always be a serious issue leading to strikes and violence and lost time, until Congress passes a law making it illegal. That is as it should be. If we pass laws that prohibit the refusal to hire a person because of race, creed or religion, certainly we should have laws which guard the economic rights of a man who chooses not to belong to a certain labor organization.

Q: Well, summing up, what are two or three basic principles of modern industrial relations which you consider of primary importance?

The first great principle is the practice of the golden rule—actually living the golden rule in your thinking and in your deeds toward your fellowmen. Certainly all the employees of your company are fellowmen. If you just put that great principle into action, we'd find ourselves well on the way to harmony and increased industrial productivity.

The second principle is to recognize the American workmen as the great fellow he is. He's an individualist. He's an optimist. He's a man of pride. He's a man of fairness, and he wants to know more about everything. There's more good in the American workmen than many of the theorists have been inclined to give him credit for having. When you go to him and tell him your story, he'll always respond and get on your team if you've told your story right and the facts are correct.

The third thing we want to remember is that everyone in the United States has hopes and aspirations and wants to get some place. This country is going places, and employees want to go with it. The greatest weakness of management is the tendency to think in terms of the *status quo*, and the unwillingness to pass along to others who are members of the organization the genuine hopes that all of us hold for a greater and brighter America.

Crush grinding segments of tank turret integral ring gear. Broach produces 11 teeth at one time on a 294-tooth, 4-pitch, 6-foot diameter gear

CRUSH GRINDING

Produces Intricate Surface Broaches

Chief advantage of the technique is the faithful reproduction of many broaches of identical accuracy. Broach surfaces are smooth, provide better performance

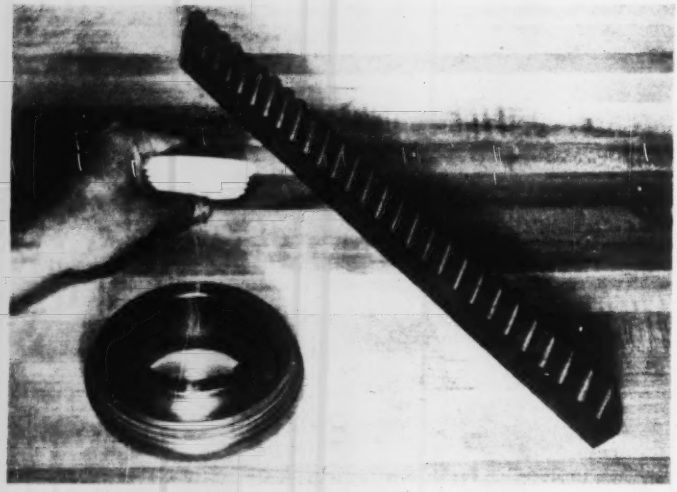
By H. H. GOTBERG
Vice President Engineering
Colonial Broach Co.
Detroit

MAJOR advantage of using crush grinding methods in the production of surface broaches is the ability to produce quantities of tools with identical accuracy. Once a master form tool is produced to the required accuracy, this form can be reproduced faithfully, and repeatedly on the cutting surfaces of quantities of broaches.

Military and peacetime product designers are continually specifying more and more intricate shapes that can be produced economically only by the broaching process. Crush grinding has been the answer in many cases. A 0.003-inch radius, for example, can be easily produced on a grinding wheel by crushing techniques.

Shape Sizes Shrink — Many intricate shapes specified by designers today are extremely small in size and require small diameter grinding wheels to back off broach cutting surfaces. A wheel as small as 3/4-inch diameter can be formed by crushing methods to meet this need.

Surface broaches produced by crush grinding are smooth. They have an excellent finish. The grinding wheel abrasive surface as crushed is 'sharp' and hard, which



Crushing roll and crush-formed grinding wheel (held in the hand) that are used in process for grinding jet engine blade slot broach shown at right

explains why smooth high finish surfaces are produced. Smooth surfaces on broaches improve performance and increase tool life. Another reason for the smooth surfaces produced is that fine grit wheels can be shaped.

Crush forming or grinding wheels that will produce surfaces of the accuracy and finish required in surface broaches has been a gradual development over the last 10 years. And there is still a long way to go before maximum advantage has been taken of the method.

Shaping Takes 3 Steps — Three main steps are required to produce a given shape in a grinding wheel. First a precision hardened master is produced. This is made to exacting tolerances and checked on a projector against a master layout of the desired shape made up to 30 times size.

In the next step, a high strength cast iron crushing roll is machined with the master form tool. Special equipment and techniques assure absolute duplication of the tool form in the iron master.

In the final step the wheel is formed in position on the spindle of the surface grinder by the crushing roll. The wheel is re-crushed when necessary to maintain tolerance specifications.

The crushing roll is remachined when work accuracy indicates that the form produced in the wheel is outside the working tolerances.

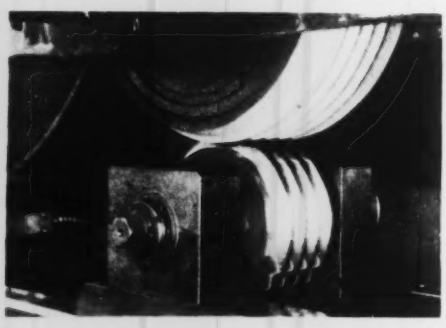
Applications—In general if six inserts or duplicate surfaces are needed for a production setup, the expense of making a form tool and utilizing crush grinding techniques is amply justified. In many cases complicated surfaces will warrant crush grinding in smaller quantities.

Accuracy of 0.0002-inch all over is the usual rather than the unusual for shapes even as intricate as those shown in the accompanying illustration.

An interesting example of application of crush grinding methods to a close tolerance surface broach is one made recently for the Detroit Arsenal on a Colonial Broach vertical broaching machine that produces 294 teeth of four diametral pitch on a 6-foot diameter tank turret ring gear in 30 minutes.

Specifications called for tooth spacing of 0.001-inch and eccentricity of 0.0005-inch per inch of diameter. The surface broach on this application has 11 teeth and is made up of a series of segments.

The pitch diameter of the involute gear teeth on the broach of course has the curvature of the ring gear. The individual segments for this broach are ground by specially developed crush forming technique.



This view shows how the grinding wheel employed in grinding segments of tank turret ring gear is crushed

Survey Covers Fat Properties

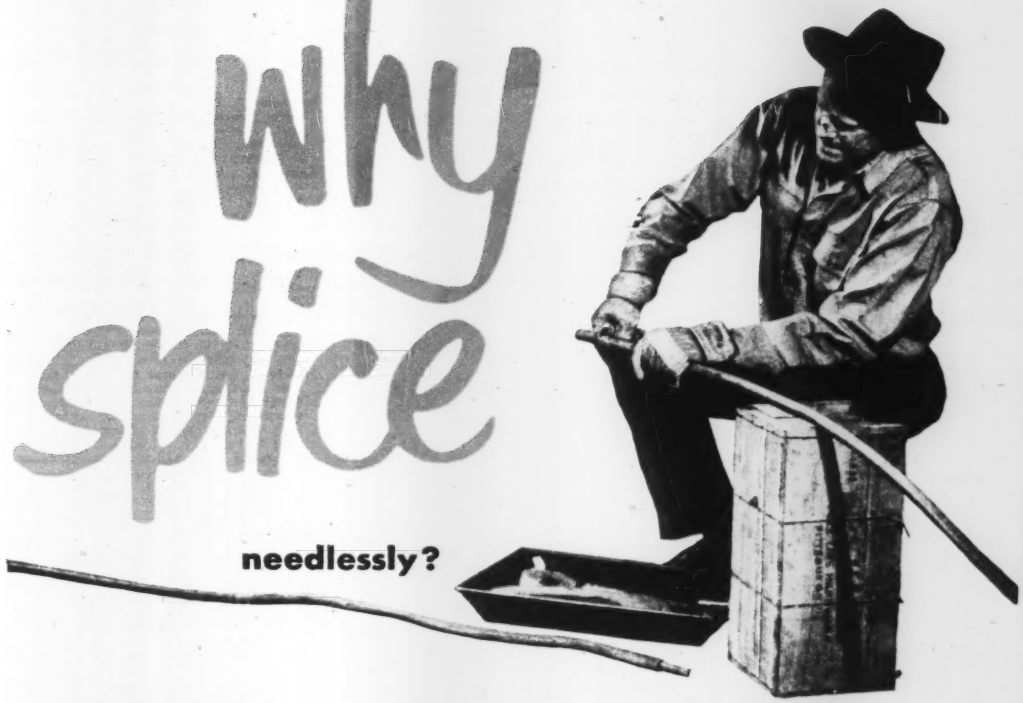
Publication of a survey that details "Properties of the Principal Fats, Fatty Oils, Waxes, Fatty Acids and Their Salts" is announced by the Texas Co., New York.

Of interest to petroleum and chemical industries, and particularly lubricant manufacturers, the survey covers properties of about 50 fats, fatty oil and waxes in its 244 pages. It records only aliphatic acids, but more than 800 of these are tabulated.

One feature is data introduced on salts of fatty acids ranging from aluminum through zirconium. About 1750 salts are listed. The company says this material never has been correlated before, adding that it includes considerable unpublished data.

In addition, the author records about 1350 literature references. The book concludes with a variety of pertinent conversion tables such as temperature, gravity, viscosity and color, and a detailed subject index.

why splice needlessly?



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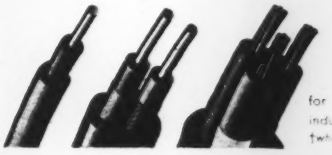

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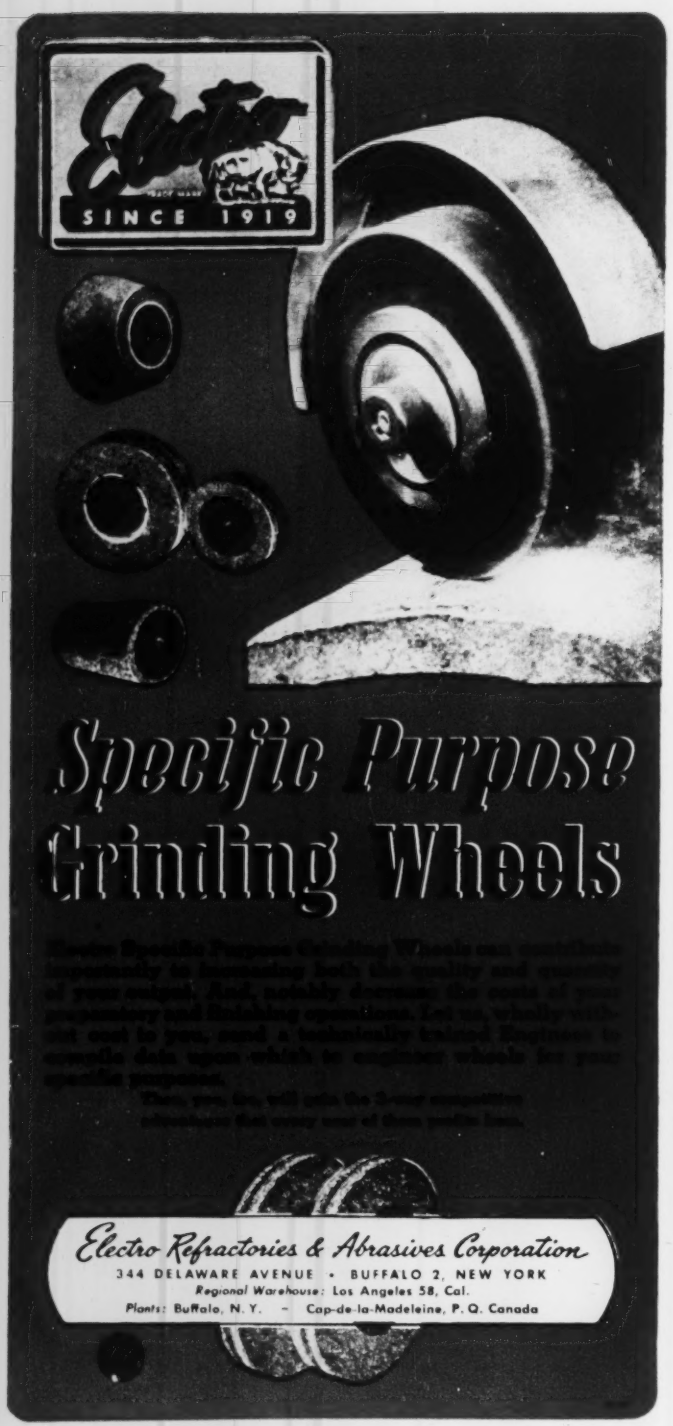
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CALENDAR
OF MEETINGS

September 3, Steel Kitchen Cabinet Manufacturers Association: Fall meeting, Hotel Cleveland, Cleveland. Association address: Engineers Bldg., Cleveland 14. Secretary: Arthur J. Tuscany.

September 3-13, Centennial of Engineering, Convocation Period: General manager, F. W. Edwards. Address: 57th St. & S. Shore Drive, Chicago 37.

September 4-5, National Conference on Industrial Hydraulics: Illinois Institute of Technology, sponsor; Hotel Sherman, Chicago. Institute address: Technology Center, Chicago 16. Conference secretary: John C. Duba.

September 4-6, American Institute of Chemical Engineers: Palmer House, Chicago. Institute address: 120 E. 41st St., New York 17. Secretary: Stephen L. Tyler.

September 8-9, National Society of Lubrication Engineers: National symposium on fundamentals of friction and lubrication in engineering, Hotel Sherman, Chicago. Society address: 343 S. Dearborn St., Chicago 4. Secretary: W. F. Leonard.

September 8-10, American Standards Association: National standardization conference, Museum of Science & Industry, Chicago. Association address: 70 E. 45th St., New York 17. Secretary: G. F. Hussey Jr.

September 8-11, American Institute of Mechanical Engineers: Fall meeting, Hotel Sherman, Chicago. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

September 8-12, Instrument Society of America: Annual fall meeting and exhibit, Public Auditorium & Hotel Cleveland, Cleveland. Society address: 921 Ridge Ave., Pittsburgh 12. Secretary: Richard Rimbach.

September 9-11, Society of Automotive Engineers: National tractor meeting, Hotel Schroeder, Milwaukee. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

September 9-13, American Chemical Society, Chicago Section: National chemical exposition, Chicago Coliseum, Chicago. Address: 86 E. Randolph St., Chicago 1.

September 10-12, Porcelain Enamel Institute: Shop Practices Forum, University of Illinois, Urbana, Ill. Institute address: Du Pont Circle Bldg., Washington 6. Secretary: John C. Oliver.

September 11, American Iron & Steel Institute: Regional technical meeting, Palmer House, Chicago. Institute address: 350 Fifth Ave., New York 1. Meeting director: Frank Ragland.

September 11-14, Packaging Machinery Manufacturers Institute: Annual meeting, The Homestead, Hot Springs, Va. Institute address: 342 Madison Ave., New York 17.

September 14-17, National Automatic Merchandising Association: Annual meeting and exhibit, Palmer House, Chicago. Association address: 7 S. Dearborn St., Chicago. Secretary: C. S. Darling.

September 14-18, Pressed Metal Institute: Annual fall meeting, Pocono Manor, Pa. Institute address: 2860 E. 130th St., Cleveland 20. Manager: Orrin B. Werntz.

September 14-19, American Chemical Society: Fall meeting, Atlantic City, N. J. Society address: 1155 16th St. NW., Washington. Executive secretary: Alden H. Emery.

September 14-20, Concrete Reinforcing Steel Institute: Semi-annual fall meeting, The Broadmoor, Colorado Springs, Colo. Institute address: 38 S. Dearborn St., Chicago 3. Secretary: H. C. Delzell.

September 15-17, Allied Railway Supply Association: Annual meeting, Hotel Sherman, Chicago. Association address: 109 N. Wabash Ave., Chicago 2. Secretary: Charles F. Weil.

September 18, Material Handling Institute: Hotel Cleveland, Cleveland. Institute address: 731-732 DuPont Circle Bldg., Washington 6. Managing director: R. Kennedy Hanson.

September 19, The Wire Association, Nonferrous Division: First regional meeting.

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Edgewater Beach Hotel, Chicago. Association address: 1028 Connecticut Ave., N.W., Washington 6. Executive secretary: Richard P. Anderson.

September 19-20, Automotive Engine Rebuilders Association: Midyear meeting. Board of directors: Edgewater Beach Hotel, Chicago. Association address: 626 N. Capitol Ave., Indianapolis. Executive vice president: R. L. Patterson.

September 16-17, Industrial Truck Association: Fall meeting. Hotel Cleveland, Cleveland. Association address: 300 P St. NW, Washington 1. Secretary: W. Yale C. Beard.

Sept. 22-24, American Coke & Coal Chemicals Institute: Fall meeting. The Greenbrier, White Sulphur Springs, W. Va. Institute address: 711 14th St. NW, Washington 5. Executive secretary: Samuel Weiss.

September 22-23, Steel Founders' Society of America: Fall meeting. The Homestead, Hot Springs, Va. Society address: 920 Midland Bldg., Cleveland 15. Secretary: F. Kermit Donaldson.

September 22-24, National Truck Body Manufacturers Association: Annual meeting. Muehlebach Hotel, Kansas City, Mo. Association address: Industrial Center Bldg., Wesleyan University, Middletown, Conn. Secretary: Sidney D. Barton.

September 22-25, American Mining Congress: Metal & nonmetallic mineral mining conference. Dupont. Congress address: 1102 Ring Bldg., Washington 6. Secretary: Julian D. Conover.

September 24-26, American Hot Dip Galvanizers Association Inc.: Fall meeting. The Greenbrier, White Sulphur Springs, W. Va. Association address: 1st Pittsburgh National Bank Bldg., Pittsburgh. Secretary: Stuart J. Swensson.

September 28-October 2, National Screw Machine Products Association: Fall convention-trade meeting. The Homestead, Hot Springs, Va. Association address: 2968 E. 140th St., Cleveland 20.

September 29-30, American Machine Tool Distributors Association: Annual meeting. The Greenbrier, White Sulphur Springs, W. Va. Association address: Box 1, Philadelphia 5. Executive secretary: Thomas H. Ryan.

September 29-Oct. 2, American Institute of Steel Construction Inc.: Annual convention. Waldorf-Astoria Hotel, New York. AISC Institute address: 101 Park Ave., New York 17. Executive secretary: T. R. Higgins.

September 30-Oct. 4, Association of Iron & Steel Engineers: Fall meeting and exhibit. Penn-Sheraton and Penn Auditorium, Convention address: 1010 Empire Bldg., Pittsburgh 22. Director: T. J. Ess.

OCTOBER

October 1-4, American Institute of Mining & Metallurgical Engineers, National Open Hearth Steel Committee: Fall meeting. Southern Ohio Section, Deshler-Wallick Hotel, Columbus 6.

October 1-5, Society of Industrial Designers: Annual meeting. Shawnee Inn, Shawnee-on-Delaware, Pa. Society address: 45 E. 17th St., New York 17. Secretary: Sally G. Sachs.

October 6-7, Rail Steel Bar Association: Fall meeting. Hotel Cleveland, Cleveland. Association address: 38 S. Dearborn St., Chicago. Secretary: W. H. Jacobs.

October 6-10, National Hardware Show: Grand Central Palace, Atlantic City, N. J. Managing director: Frank Yeager.

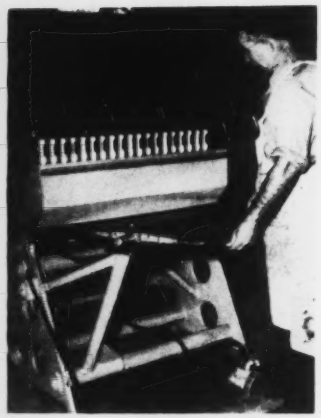
October 9, American Iron & Steel Institute: Regional technical meeting. William Penn Hotel, Pittsburgh. Institute address: 350 Fifth Ave., New York 1. Meeting director: Frank Ragland.

October 11-14, National Association of Waste Material Dealers Inc.: Fall meeting. Los Angeles. Association address: 271 Madison Ave., New York. Secretary: Clinton M. White.

October 13-17, American Institute of Electrical Engineers: Fall general meeting. New Orleans, La. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

October 16-17, Gray Iron Founders' Society Inc.: Annual meeting. Hotel Cleveland, Cleveland. Society address: 210 National City E. 6th St. Bldg., Cleveland. Secretary: Donald H. Workman.

October 16-18, Foundry Equipment Manufacturers Association: Annual meeting. The Greenbrier, White Sulphur Springs, W. Va. Association address: Engineers Bldg., Cleveland 14. Secretary: Arthur J. Tuscany.



Drills 19 at Same Time

Leading edge of this missile fin gets 19 holes drilled at once. Operator flips fin and drills seven holes in the trailing edge. Complete operation takes 36 seconds. Old time: 4.2 min.

October 18-19, American Society for Metals: Annual semmar. Benjamin Franklin Hotel, Philadelphia. Society address: 7301 Euclid Ave., Cleveland 3. Secretary: W. H. Eisenman.

October 19-21, Conveyor Equipment Manufacturers Association: Annual meeting. The Greenbrier, White Sulphur Springs, W. Va. Association address: No. 1 Thomas Circle, Washington 5. Executive vice president: R. C. Silberberger.

October 20-22, Packaging Institute: Annual meeting. Hotel Commodore, New York. Institute address: 342 Madison Ave., New York 17. Secretary: J. V. Burton.

October 20-24, American Society for Metals: Annual meeting. Benjamin Franklin Hotel, Philadelphia. Society address: 7301 Euclid Ave., Cleveland 3. Secretary: W. H. Eisenman.

October 20-24, American Welding Society: Annual meeting. Bellevue Stratford Hotel, Philadelphia. Society address: 33 W. 39th St., New York 18. Secretary: J. G. Magrath.

October 20-24, Society for Non-Destructive Testing Inc.: Annual meeting. Philadelphia. Society address: Box 710, Evanston, Ill. Secretary: Philip B. Johnson.

October 20-24, American Institute of Mining & Metallurgical Engineers: Fall technical session, Philadelphia. Institute address: 29 W. 39th St., New York 18. Secretary: Edward H. Robie.

October 20-24, National Metal Congress & Exposition: Convention Hall, Philadelphia. Secretary: W. H. Eisenman, 7301 Euclid Ave., Cleveland 3.

October 20-24, National Safety Council: National safety congress & exposition. Conrad Hilton Hotel, Chicago. Council address: 425 N. Michigan Ave., Chicago 11.

October 22-24, Porcelain Enamel Institute: Annual meeting. The Greenbrier, White Sulphur Springs, W. Va. Institute address: DuPont Circle Bldg., Washington 6. Secretary: John C. Oliver.

October 22-24, Society of Automotive Engineers: National transportation meeting. William Penn Hotel, Pittsburgh. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

October 27-29, National Lubricating Grease Institute: Annual meeting. Edgewater Beach Hotel, Chicago. Institute address: 4638 J. C. Nichols Parkway, Kansas City 2, Mo. Executive secretary: Harry F. Bennetts.

October 27-29, American Gear Manufacturers Association: Fall meeting. Edgewater Beach Hotel, Chicago. Association address: 302 Empire Bldg., Pittsburgh 22. Executive secretary: John C. Sears.

October 27-30, American Gas Association: Annual meeting and exposition. Municipal Auditorium, Atlantic City, N. J. Association address: 420 Lexington Ave., New York 17. Secretary & convention manager: Kurwin R. Boyes.

October 27-31, Electrochemical Society Inc.: Fall meeting. Mt. Royal Hotel, Montreal. Society address: 235 W. 102nd St., New York 25. Secretary: Dr. Henry B. Linford.

October 30-November 2, National Tool & Die Manufacturers Association: Annual meeting. Hotel Sheraton, Rochester, N. Y. Association address: 906 Public Square Bldg., Cleveland. Executive secretary: George S. Eaton.

NOVEMBER

November 3-4, Society of Automotive Engineers: National diesel meeting. Hotel Chase, St. Louis. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

November 5-9, Scientific Apparatus Makers Association: Mid-year meeting, industrial instrument, laboratory equipment, optical, aeronautical and military instrument sections. The Homestead, Hot Springs, Va. Association address: 20 N. Wacker Drive, Chicago 6. Secretary: Kenneth Anderson.

November 6-7, Society of Automotive Engineers: National fuels and lubricants meeting. The Mayo, Tulsa, Okla. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

November 8-9, Open Steel Flooring Institute Inc.: Fall meeting. The Greenbrier, White Sulphur Springs, W. Va. Institute address: 2311 First National Bank Bldg., Pittsburgh 22. Secretary: Stuart J. Swensson.

November 9-11, Grinding Wheel Institute: Annual meeting. Hotel Claridge, Atlantic City. Institute address: 2130 Keith Bldg., Cleveland 15. Manager: F. A. Peterson.

November 9-11, Abrasive Grain Association: Annual meeting. Hotel Claridge, Atlantic City. Institute address: 2130 Keith Bldg., Cleveland 15. Manager: F. A. Peterson.

November 10-11, The Magnesium Association: Annual meeting and exhibit. Hotel Biltmore, New York. Association address: 122 E. 42nd St., New York 17. Assistant secretary: (Miss) Martha I. Hansen.

November 10-13, The Wire Association: Annual meeting. Hotel Carter, Cleveland. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

November 10-14, National Electrical Manufacturers Association: Annual meeting. Haddon Hall, Atlantic City, N. J. Association address: 155 E. 44th St., New York 17. Secretary: W. J. Donald.

November 14, American Iron & Steel Institute: Regional technical meeting. Hotel Mark Hopkins, San Francisco. Institute address: 350 Fifth Ave., New York 1. Meeting director: Frank Ragland.

November 19, American Standards Association: Annual meeting. Waldorf-Astoria Hotel, New York. Association address: 70 E. 45th St., New York 17. Secretary: G. F. Hussey, Jr., Adm. U.S.N., Ret.

November 20-21, American Society for Personnel Administration: Fall meeting & exhibit. Hotel Schroeder, Milwaukee. Society address: 2917 E. 79th St., Cleveland. Secretary: Mary E. Hopkins.

November 21, Association of American Railroads: Annual meeting. Waldorf-Astoria Hotel, New York. Association address: Transportation Bldg., Washington 6. Secretary-Treasurer: G. M. Campbell.

November 30-December 5, American Society of Mechanical Engineers: Annual meeting. Statler and McAlpin Hotels, New York. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

DECEMBER

December 3-5, American Leather Belting Association: Fall meeting. Hotel Commodore, New York. Association address: 320 Broadway, New York 7. Secretary: E. R. Rath.

December 3-5, Society for Experimental Stress Analysis: Annual meeting. Hotel McAlpin, New York. Society address: Box 168, Cambridge, Mass. Secretary: W. M. Murray.

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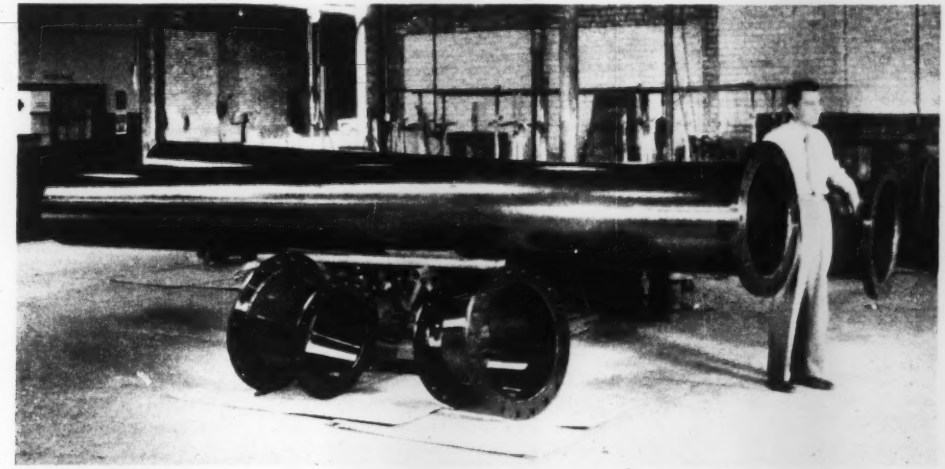
Baking Type **PHENOLIC OIL FREE COATINGS** **Self-Curing Type**

Innumerable applications of HERESITE will testify to the protection against practically all metal corroding substances as well as assuring production free of metal contamination. In most cases continuous operating temperatures of 400° F. have no effect on HERESITE baking type coatings. The exceptional high resistance and ability to withstand thermal-shock, vibration and elevated temperature make HERESITE coatings ideal for applications to various equipment.



Illustrated above are 24" dia. x 20' long HERESITE processed pipe which are to be placed in underground service.

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Our SYNTHETIC RUBBER available in SHEET FORM and as a LIQUID COATING for protection of steel.

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- **Complete** shearing, cutting and burning service—Our modern equipment enables you to get your steel cut quickly and accurately to your specifications—regular warehouse charges apply.
- **A "one-call" source** for all your steel needs—Carbon—Alloy—Stainless—Tubing—Aluminum—Machinery and shop supplies. We stock them all for you—no *extra* charge.
- **Personalized Service**—*All* of our people are trained to treat you right.

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UNITED STATES STEEL

3 243

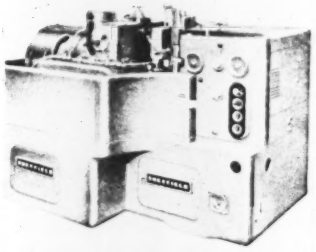
STEEL

New Products and Equipment

Gear Grinding Machine

USE REPLY CARD—CIRCLE No. 1

Introduction of its model 140 gear grinding machine is announced by Sheffield Corp., Dayton 1, O. Machine achieves mass production in turning out gears at uniform accuracy. In operation, periphery of the wheel is formed



. . . mass production at uniform accuracy

with a helical rib by a combination of preformed Crushtrue and diamond dressing.

The gear blank, mounted on a mandrel between vertical dead centers, rotates continuously at a set rate in direct relationship to the grinding wheel into which it is fed in an upward direction during grinding. Work and grinding wheel drives are interconnected by gearing that can be changed easily as required by the number of teeth to be ground.

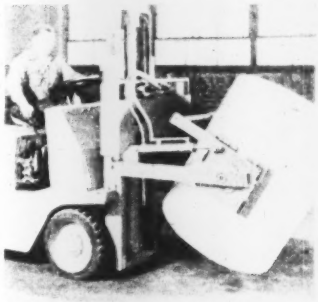
Work can be removed from the grinding wheel without stopping the machine. When replaced, its proper location is automatic and done without further adjustment. Machine accommodates gears up to 8 inches diameter and grinds up to 4-inch maximum length of teeth. Pitch ranges from a minimum 50 diametral to a maximum 8 diametral or 0.4 circular.

Roll Clamp Attachment

USE REPLY CARD—CIRCLE No. 2

Detachable roll clamp attachment for fork trucks, designed to pick up and stack cylindrical objects horizontally or vertically, is offered by Baker-Raulang Co., 1230 W. 80th St., Cleveland 2, O. Clamp permits truck operators to pick up and haul drums, large pipe or other cylindrical objects from 1½ to 3 feet in diameter. Attachment rotates 90 degrees in a vertical plane. Clamping pressure is controlled by an adjustable relief valve in the hydraulic system.

Installment is made on the firm's four-purpose carriage—a unit that combines fork spacing, side shifting, clamping and standard fork



. . . picks up, stacks cylindrical objects

use. Clamp detaches in about 2 minutes and is available for any of the company's trucks in the 1000 to 4000-pound capacity range.

Voltage Measuring Reactor

USE REPLY CARD—CIRCLE No. 3

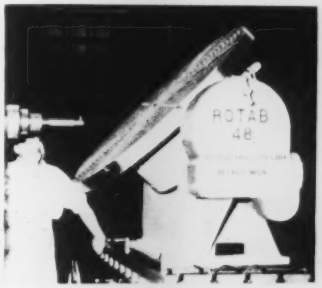
Increased safety in measurements of direct current voltage by insulating the instrument circuit from the power source is featured in a voltage-measuring reactor offered by Special Products Section, General Electric Co., Schenectady 5, N. Y. Common practice in measuring direct current voltages calls for bringing leads directly from the source to the instrument panel. Thus, in measuring circuits of more than 500-v, danger exists from faulty insulation, open circuits or improper grounding. Function of the controlled reactor is to minimize this problem.

Developed for remote measurements up to 1200 v, the equipment consists of a saturable core reactor with a single direct current winding, two alternating current windings and proper range resistors. A selenium bridge rectifier is used in the alternating current circuit to permit interpretation of the average current. A calibrating adjustment is provided with the device that permits final adjustment of the output current to the burden used.

Radial, Boring Mill Workholder

USE REPLY CARD—CIRCLE No. 4

A machine designed for holding work during machining or checking radial or angular operations, the 48-inch Rotab, is introduced by Machine Products Corp., 6777



. . . rotating faceplate simplifies setup

E. McNichols Rd., Detroit, Mich. Unit is specially adapted for radial and boring mill operations.

Motor located under the table and hooked up to the table by direct drive rotates the faceplate at 5 rpm under pushbutton control, simplifying work setup. Handwheel is used to complete the setting accurately, usually within 2 minutes, by vernier graduations on a scale. Faceplate can be rotated

REPLY CARDS

on page 125 will bring you more information on any new products and equipment in this section.

FOR RESISTANCE WELDING AT ITS FINEST . .

Always Specify FEDERAL

This two-post spot welder, designed and built for a leading automobile producer to simultaneously weld three sections of cowl ventilator air chamber to dash panel is an example of Federal welder design flexibility.

Tooling, consisting of shunt die and hydraulically operated guns can be readily modified for welding of other parts with consequent savings in capital expenditure and changeover time.

FIRST IN RESISTANCE WELDING

Federal® WELDERS

Warco® PRESSES

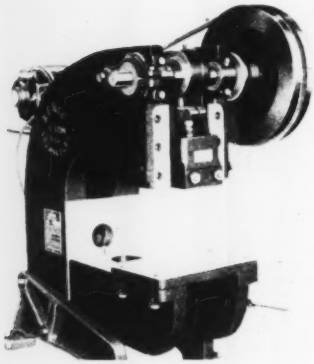
THE FEDERAL MACHINE & WELDER COMPANY
WARREN, OHIO

to any degree, and adjusted to any angle from vertical to horizontal—or to 30 degrees below horizontal the opposite way. Plate surface is divided by eight T-slots 11/16-inch wide running to the outer rim to provide clamping facilities.

Light Press for Heavy Jobs

USE REPLY CARD—CIRCLE No. 5

Kenco Mfg. Co., 5211 Telegraph Rd., Los Angeles, Calif., offers its 4 or 5-ton punch press, a heavy-duty unit weighing 275 to 450 pounds. Among features are a $12\frac{3}{4}$-inch throat, variable speed and adjustable ram clamp. Speed



features $12\frac{3}{4}$-inch throat

can be regulated by one simple adjustment for 90 to 280 strokes per minute. Ram clamp adjusts from 1 to 1-9/16-inch.

Safety factor designed for clutch drive causes shear at excessive overload, preventing press breakage. Nonrepeat safety mechanism eliminates possibility of double trips. A 3-inch drop in the movable bed accommodates larger dies or die sets.

Surface Comparator Redesigned

USE REPLY CARD—CIRCLE No. 6

Greater flexibility and easier portability are features of Faxfilm surface comparator, model BL-122, offered by Brush Development Co., Cleveland 14, O. Comparator provides comparison projection of two replicas at 30 diameter magnification. Unit is 25 x 12 inches at the base and $22\frac{1}{2}$ inches high. Total weight is less than 30 pounds.

Let the chips fall where they may...

Chase® Free-Cutting Brass is readily cleared

For heavy feeds and high cutting speeds you can't beat Chase Free-Cutting Brass rod and bar. Chips from these Chase copper alloy products are short and brittle and are readily cleared from the cutting tools even during rapid and intricate cutting operations. That means longer production runs and longer life for your tools.

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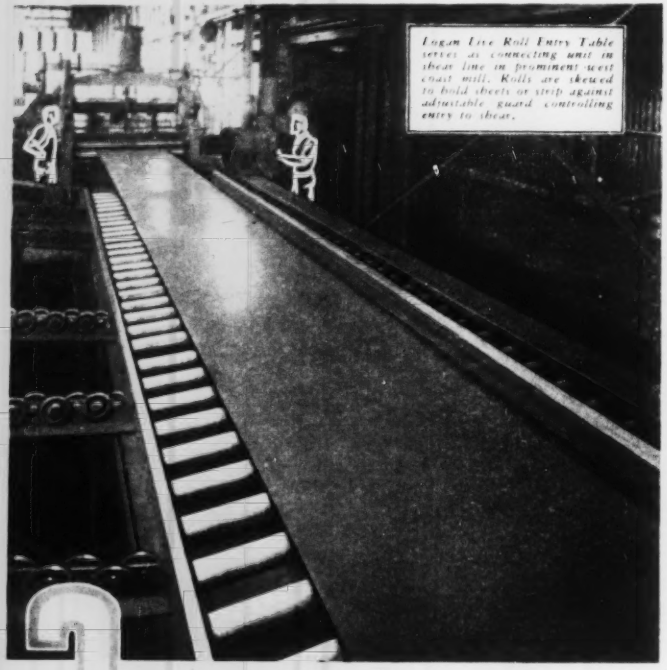

Logan Live Roll Entry Table serves as connecting unit in shear line in prominent west coast mill. Rolls are skewed to hold sheets or strip against adjustable guard controlling entry to shear.

2 (or more) savings are better than 1

IT'S GOOD BUSINESS to conveyorize every possible operation in the modern industrial plant. Savings-with-conveyors in one department are fine, but why not make these savings in other departments—wherever you can?

In many mills and factories, Logan Conveyors are the basis for *all* material movement. It pays.

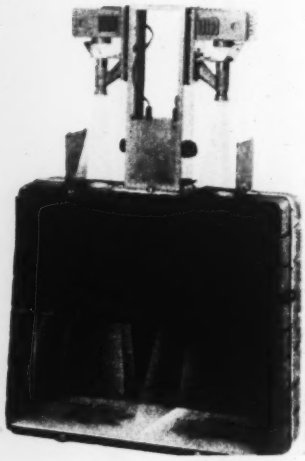
If you have a handling problem, remember there is no additional charge for Logan's two generations of pioneering experience in engineering and construction. Write for literature, or the nearest Logan engineer is at your service.

Logan Conveyors

LOGAN CO., 535 CABEL ST., LOUISVILLE, KY.

including accessory and file case carried at the base.

Principal applications include comparison of work specimens with standard finishes in surface roughness inspection, comparison of finishes obtained in machinability studies and comparisons of surface changes in wear and life tests.



. . . greater flexibility, easier portability

Mobile Crane-Trailer Hookup

USE REPLY CARD—CIRCLE No. 7

Trailer Transport, developed by Silent Hoist & Crane Co., 841-877 63rd St., Brooklyn 20, N. Y., is linked integrally with the firm's Swing-Boom crane. Dual-purpose equipment provides a mobile unit for lifting, stacking, spotting and loading applications, at the same time functioning as a transporter for carrying and delivering bulky materials.

Crane provides dual seats and dual operator controls so the unit can be operated in congested areas or narrow aisles without turning the machine around.

Roller Curve Has Chain Drive

USE REPLY CARD—CIRCLE No. 8

Chain drive that travels around the outside perimeter of the curve is a feature of a live roller curve offered by Samuel Olson Mfg. Co. Inc., 2423-25 Bloomingdale Ave., Chicago 47, Ill. Each chain link has a flat top plate arranged so the

Here at Sterling Bolt Co., a single, integrated DEPENDABLE source can supply you with more than **200,000** stock and standard sizes in Bolts, Nuts, Screws and Washers for your specific needs.

For more than 35 years Sterling Bolt has been a prime supplier of metal fastenings to America's best-known companies—because Sterling facilities combine both warehouse and mill, giving you advantages of **PROMPT SERVICE** and **COMPETITIVE DISCOUNTS**.

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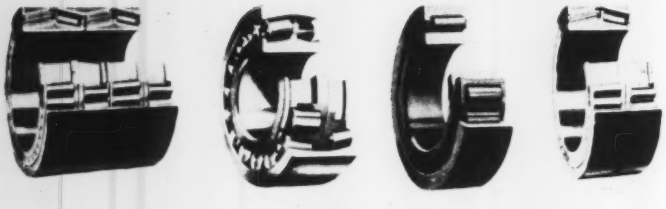
designed for harmony...



Torrington engineers have a thorough knowledge of the friction problems encountered in virtually every type of mechanical equipment. And they have had many years of experience with *all* types of anti-friction bearings. They are able to give sound, unbiased recommendations for the bearings best suited for the job at hand. Result: a harmonious blending of anti-friction bearing types with the products in which they are used.

Torrington engineers will be glad to help you—as they have many others—to select the bearings which will assure your products smooth, dependable operation.

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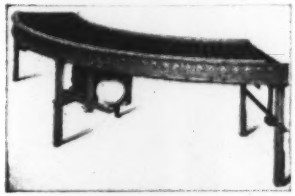
TORRINGTON BEARINGS

Spherical Roller • Tapered Roller • Straight Roller • Needle • Ball • Needle Rollers

plates form a continuous flexible band when the chain is assembled. The outside, or drive end, of the rollers is equipped with rubber bushings that ride on the top plates of the chain. Contact of rubber bushing with plate drives the rollers. Rollers can be driven at speeds up to about 120 fpm.

Curves can be furnished with either tapered or straight rollers. Tapered units are available in



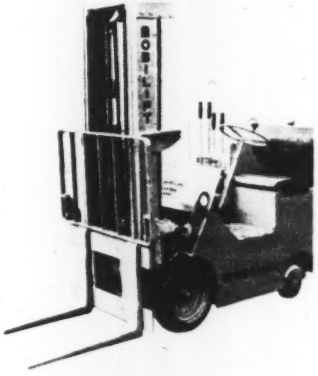
. . . rubber bushings ride on the top plates

widths of 12 to 18 inches with outside radius of 4 feet, 1½-inch; they are also made 20 to 24 inches wide with outside radius of 5 feet, 7½ inches. Straight roller curves can be furnished in any radius and any width.

Sit-Down Type Fork Lift Truck

USE REPLY CARD—CIRCLE No. 9

Independent rear wheel suspension is a feature on the 3000-pound model HR sit-down type fork trucks made by Mobilift Corp.,



. . . has independent rear wheel suspension

409 S. W. 13th Ave., Portland 5, Oreg. The suspension system is designed to cut down driver fatigue while reducing shock to load and

THERE'S plenty of experience behind the airline pilot, whose responsibilities demand special training and knowledge.

You'll find an equally important background of experience behind the production of metal stampings at Worcester Stamped Metal — where responsibility to industry demands the manufacture of component parts, based on advanced technical knowledge and the most accurate methods.

Perhaps you need stamped parts for a new product — or have a problem in re-design! Worcester Stamped Metal engineers are specialists in the planning and scheduled production of light, heavy and deep drawn stampings from steel, stainless steel, aluminum — and other metals and alloys . . . on long or short run requirements.

Competent supervision, modern equipment and trained personnel assures high quality stampings and "on time" deliveries. Send samples and blueprints for quotations.

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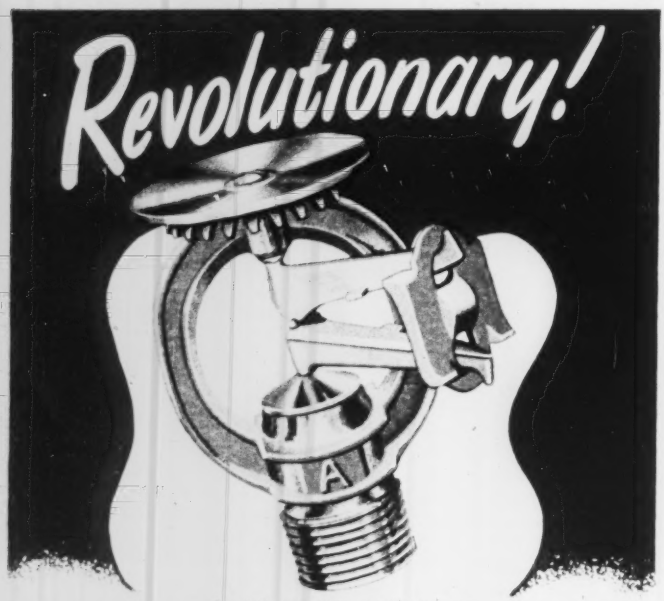
SPECIALISTS IN SKILLED STAMPING SERVICE



"Automatic" SPRAY Sprinkler

LIFE-PROPERTY-MONEY SAVER!

Here's the most revolutionary development in the science of fire protection. Now, new buildings or buildings that are not presently fire safe can realize substantially better protection and—**at no additional cost.** Sprinklered properties can be made **PLUS-SAFE** by merely replacing old style sprinkler heads with the new "Automatic" **SPRAY** Sprinklers.

An investment in "Automatic" **SPRAY** Sprinkler protection is an investment in the future security of your own business. Get complete information from your nearest "Automatic" Sprinkler fire safety engineer or clip and mail the coupon for our free illustrative folder.

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"Automatic" Sprinkler

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"AUTOMATIC" SPRINKLER CORP. OF AMERICA
P. O. BOX 360
YOUNGSTOWN 3, OHIO

NAME
COMPANY
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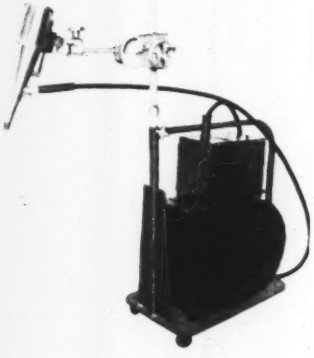
vehicle. It consists of a heavy duty spring and an airplane type shock absorber for each rear wheel.

Lift mechanism retains the company's roller chain lift with hydraulic tilt cylinders. Standard mast heights for the model are 63, 72 and 83 inches. Additional heights are available for special applications. Equipment is powered by an air cooled 3-cylinder engine, with two-speed transmission. Improved air intake pulls air through a grilled opening channeled through the counterweight.

Semiautomatic Welding Gantry

USE REPLY CARD—CIRCLE No. 10

Gantry for semiautomatic welding units, offered by Hillco Inc., 2741 E. Latimer, Tulsa, Okla., features a rapid, tri-directional adjustment for the welding gun. An added feature of this fixture is the easy access the operator has to all controls because the entire unit



. . . rapid tri-directional adjustment

fits compactly on a caster stand within easy reach. Standard rack makes all circumferential welds from a practical minimum to 54 inches diameter.

Power-Pumps Dispense Material

USE REPLY CARD—CIRCLE No. 11

Air-motor operated pumps and accessories for automatic application of heavy to light-range materials are offered by Lincoln Engineering Co., 5702-33 Natural Bridge Ave., St. Louis 20, Mo. Among materials applied are seal-

Clean, strong, bright, workable

In every stainless operation McLouth Stainless Steel gives you faster unit production and better products. The strength and bright, clean finish of this high grade steel makes it easily workable into your products.

McLouth Stainless Steel is made in the exact grade, finish, gauge and chemical composition required. Your products will have a high resistance to corrosion and have longer life and more sales appeal when you use McLouth Stainless Steel.

Ask for a McLouth Service Engineer to analyze your stainless requirements.

When the product you make today or the product you plan for the future calls for stainless, *make it with McLouth Stainless Steel.*

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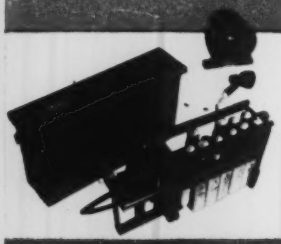
CORPORATION
DETROIT AND TRENTON, MICHIGAN

HOT AND COLD ROLLED STAINLESS AND CARBON SHEET AND STRIP STEEL

Femco

TROLLEYPHONES
GET THINGS DONE



Wherever there are power rails or power lines, installations of Femco Trolleyphones can speed production, cut costs, promote safety and improve work conditions.

In better team work alone, Femco Trolleyphones pay for themselves. Consider—As many moving or stationary stations as are needed all brought in continuous contact with dispatchers and each other!

THE FEMCO TROLLEYPHONE IS ONE OF THE SIMPLEST, MOST USEFUL COMMUNICATION SYSTEMS EVER DEVISED.

Demonstrations Arranged at No Charge
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NEW PLUG-IN MODEL
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349 Brushton Ave., Pittsburgh 21, Pennsylvania

ers, adhesives, roofing, waterproofing, insulating and caulking compounds.

Eleven standard models provide complete systems for spray gun, pole gun and flow gun applications. Models are available for use with original 400 and 100-pound drums and with containers for 5-gallon material package.

Intricate Jobs Cut

USE REPLY CARD—CIRCLE No. 12

Attachment for its electric power drills, a unit called the Nibbler, is offered by Mall Tool Co., 7728 S. Chicago Ave., Chicago 19, Ill. The unit provides an ideal tool for intricate metal cutting jobs in sheet steel, brass, copper or fiber up to 0.04-inch. Width of cut is $\frac{1}{8}$-inch.

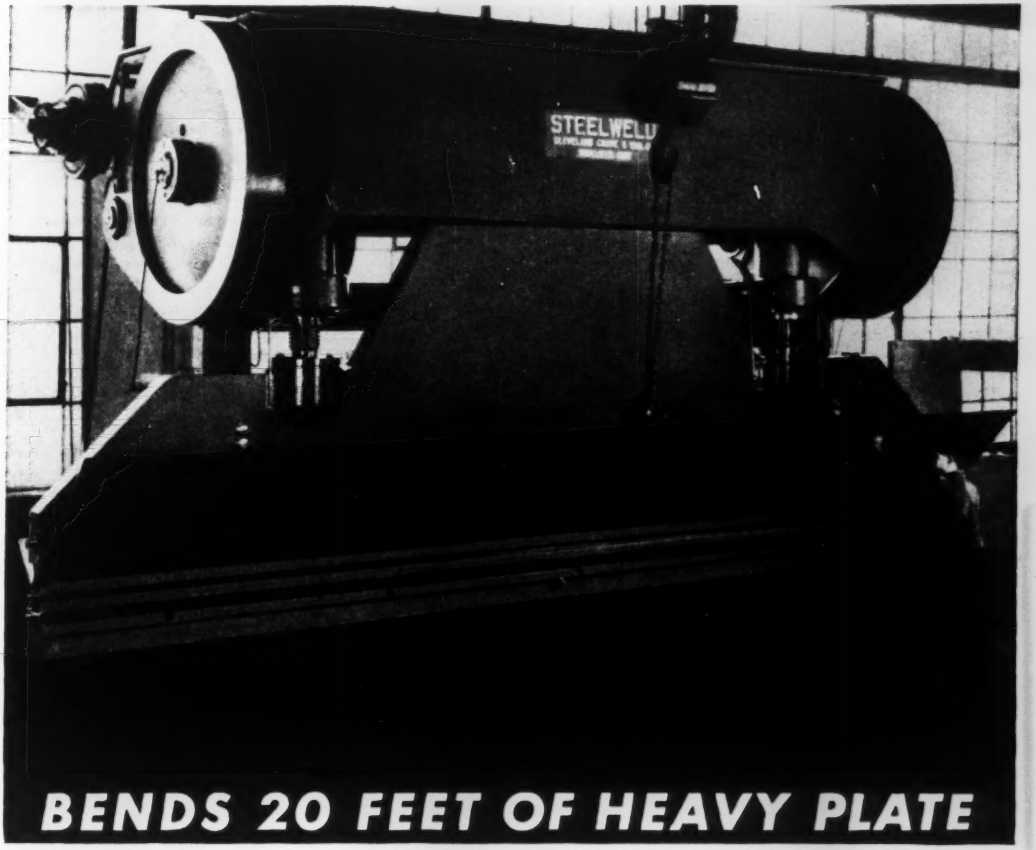
. . . operates from 800 to 3500 rpm

A high-speed punch-type attachment, it operates with any $\frac{1}{4}$-inch capacity standard or heavy-duty electric drill at speeds from 800 to 3500 rpm.

Air Powered Work Feeder

USE REPLY CARD—CIRCLE No. 13

Two-station electrically controlled air powered work feeder, the Transfeed, is offered by Bellows Co., 230 W. Market St., Akron 9, O. An addition to the firm's line of controlled air power devices, the feeder consists of a movable mild steel table top 11/16-inch thick, by $5\frac{1}{4}$ inches wide, by 12 inches long. Top is guided between hardened and ground dovetail ways. Power for the trans-



BENDS 20 FEET OF HEAVY PLATE

Model L 5½-12 Steelweld Press bending $\frac{5}{16}$" steel plate, 20'-0" long

How long does it take you to weld or rivet two $\frac{5}{16}$" x 20'-0" steel plates together at right angles? How long if you were making a U-shaped or Z-shaped item?

For work of this sort you will find a Steelweld Press a most useful tool. It will cut time and cost to a small fraction. You will save even when you only have occasional odd jobs. For production runs the reduction in time is tremendous. And you will save rivets and angles or welding rod and power too.

Bending is just one of the various types of work you can do on a Steelweld Press.

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CHICAGO 9 — C. H. Martin, A. A. Engelhardt, 4209 South Western Blvd.
CLEVELAND 15 — Wallace F. Schott, 1900 Euclid Ave.
HOUSTON 1 — R. E. McArdle, 5724 Navigation Blvd.
CANADA — Walker Metal Products, Ltd., Windsor, Ontario
EUROPE — S. O. F. I. M., Paris 8, France

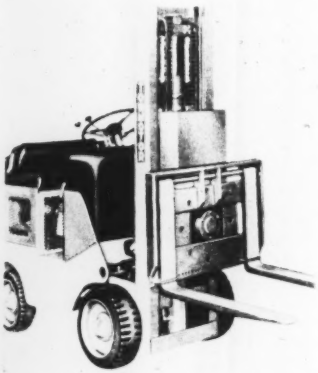
verse motion is supplied by the company's special BEM 5-60 air motor.

Unit has a 6-inch transverse positioning stroke that allows the operator to load and unload work at one end of the table while machining operation takes place at the other end. Fixtures for holding the work can be mounted directly to the table top or to oversize table tops. Feeder can be operated by pushbutton, foot switch or can be synchronized or interlocked with the firm's other control devices.

Lift Carriage Rotates Load

USE REPLY CARD—CIRCLE No. 14

Load handling for container-to-container transfer is eased by a revolving carriage introduced as a standard accessory by Towmotor Corp., 1226 E. 152nd St., Cleveland 10, O. Carriage handles solid,



. . . completely emptied in about 5 seconds

liquid or granular materials with equal effectiveness, rotating loads 360 degress. Mounted on the forks, a container can be completely emptied in about 5 seconds. Speed and direction of rotation can be controlled closely.

Contact-Making Instrument

USE REPLY CARD—CIRCLE No. 15

A contact-making instrument that serves the dual function of both indication and control is announced by Weston Electrical Instrument Corp., Newark 5, N. J. Known as model 1087, it is of the core magnet mechanism type and

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the polyethylene insulating tube sealer combine to make Exide-Ironclad, *more than ever before*, YOUR BEST POWER BUY . . . AT ANY PRICE.

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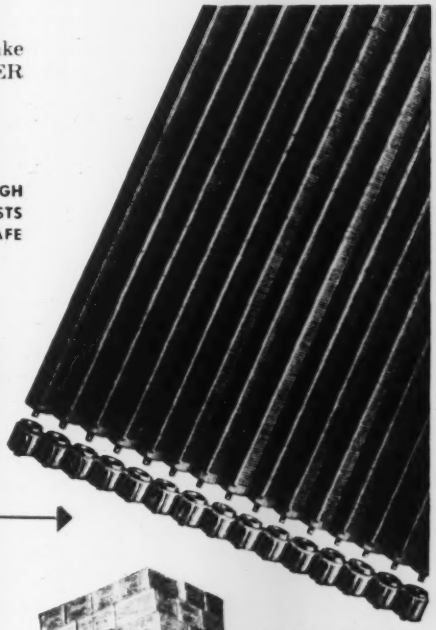
BECAUSE OF . . .

IMPROVED POSITIVE PLATE CONSTRUCTION. The long-life grids now contain SILVIUM—an alloy of silver, lead and other components—which make them highly corrosion resistant.

. . . the New Polyethylene insulating tube sealer of acid-proof, non-corroding plastic. It fits snugly into slotted tubes of positive plate, and reduces loss of active material. Even the small sediment deposit of the past is reduced 50%. Thus more active material remains available, and the high battery capacity is maintained for a longer working life.



VISIT EXIDE BOOTHS 128, 129
Iron & Steel Exposition
Cleveland, Sept. 30, Oct. 1, 2, 3

IMPROVED NEGATIVE PLATES for higher electrical efficiency.

NEW SEALING COMPOUND—provides permanent seal between jar and cover.

SEAMLESS SHOCK-PROOF JAR, of high quality rubber combines tensile strength and elongation for long-life and heavy-duty service.

NEW UNBREAKABLE PLASTIC VENT PLUGS of polyethylene.

TYPES, SIZES AND CAPACITIES for all kinds and makes of battery-electric trucks—hand and rider.

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Philadelphia 2

Exide Batteries of Canada, Limited, Toronto

1888
DEPENDABLE BATTERIES FOR 64 YEARS
1952

EXIDE-IRONCLAD and SILVIUM Reg. T.M. U.S. Pat. Off.

Clearing presses are much in evidence in the Kaiser-Frazer Shadywillow plant, opened some months ago in the Wheeling area. The one in the photo is part of a line of four Clearings forming a production group in the new plant.

Kaiser-Frazer knew exactly what they were doing when they chose these Clearing presses. You see, there are Clearing presses in the parent plant at Willow Run, and they've been on the job there for quite a while.

CLEARING MACHINE CORPORATION

6499 WEST 65TH STREET ★ CHICAGO 38, ILLINOIS

HAMILTON DIVISION, HAMILTON, OHIO

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THE WAY TO EFFICIENT MASS PRODUCTION

has two adjustable stationary contacts, and a contact that is carried on the pointer. Low and high stationary contacts, mounted on indices, make or break under direct influence of current in instrument moving coil.

Plug-In Alarm Annunciators

USE REPLY CARD—CIRCLE No. 16

Tel-Alarm, an automatic alarm unit for remote signalling of failure or other than normal operation of valves, pumps, etc., is announced by Tigerman-Anderson Co., Chicago, Ill. Units are hermetically sealed, self-contained and plug into the chassis as easily as a vacuum tube.

Cold Cathode Triode Tube

USE REPLY CARD—CIRCLE No. 17

Haledy Electronics Co., New York, N. Y., has developed a cold cathode triode tube that is applicable as a control for all types of industrial electronic equipment. Known as TT-1, it contains an external electrode and can operate under any temperature conditions, eliminates warm up time and stand-by currents.

Air Vibrator for Bench Work

USE REPLY CARD—CIRCLE No. 18

Type VG air vibrator, available from Cleveland Vibrator Co., Cleveland, O., has been redesigned for use on bench applications requiring vibrations. It is installed on a bench with faceplate and bolts. A steel U-shaped head functions as a vise to clamp the form or device to be vibrated.

Aluminum Coatings

USE REPLY CARD—CIRCLE No. 19

Aluminum coatings suitable for high temperature uses are announced by Raymond C. Crippen Research & Development Labora-

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

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71. Air Cleaner

Logan Engineering Co.—The Aridifier, a mechanical cleaner that removes 92 per cent of oil, moisture and dirt from compressed gas and air lines, is feature of descriptive 8-page catalog 252. Typical installations, capacity charts and dimension tables are presented.

72. Corrosionproof Cements

Atlas Mineral Products Co.—Technical data and catalog information on four basic types of corrosionproof cements are to be found in 12-page illustrated bulletin No. 5-2. Charts show temperature range of each cement and its resistance to broad classes of corrosives. Resistance tables rate each cement for 176 common chemical materials. Estimating tables are included for three principal acidproof brick and cement constructions.

73. Vacuum Tube Electrometers

Keithley Instruments — Complete descriptions and application diagrams for 17 basic uses are included in 8-page bulletin on vacuum tube electrometers and accessories. Uses include potential measurements to 200 v, sensitivity in location and detection of static fields, current measurements to 10^{-14} amp and resistance measurements up to 10^{16} ohms.

74. Drill Presses

Cincinnati Lathe & Tool Co., Canedy-Otto Div.—Details of the C-O 14-in. 3000 FV floor model drill press are given in 4-page illustrated bulletin D-110. This machine features sliding head, square and round tables, six speeds and 1-in. capacity in mild steel.

75. Bulk Materials Conveyors

Link-Belt Co.—Granular, flaky, crushed, ground or pulverized materials are efficiently handled by Bulk-Flo conveyors and elevators described in 28-page booklet No. 2475. It contains application photos, typical layout drawings, engineering data, calculation tables, charts and formulas. Over 150 materials are analyzed for average weight and size, flowability and abrasiveness characteristics.

76. Carbide Drills

General Electric Co., Carboloy Dept.—"How to Drill Cast Iron with Carbide Tipped Twist Drills" is title of comprehensive data book. Included are detailed instructions on procedures as well as reports covering recent results in working with carbide twist drills in cast iron.

77. Large Diameter Grinder

Landis Tool Co.—The type CHW plain grinding machines described in 4-page illustrated bulletin CB-52 are designed to accommodate large diameter work pieces such as jet turbine rotors, large motor armatures and water valves. The 30, 36 and 48-in. machines feature extra-wide carriage way spacing.

78. Write-On-It Tape

Labelon Tape Co.—Many of the 1001 uses and an actual sample of Labelon write-on-it tape are included in 6-page illustrated Form No. 8. This pressure-sensitive tape can be applied to any smooth dry surface; takes writing with pencil, stylus or dry ball point pen, and is extremely durable. Various colors and widths are available.

79. Weldments & Castings

Acme Tank & Welding Div., United Tool & Die Co.—Basic facts about steel plate fabrication as compared to castings are presented in 24-page illustrated booklet "The Facts About Weldments and Castings." Much data are in tabular form. If you specify castings, this booklet is a must.

STEEL
Penton Building, Cleveland 13, Ohio

9-1-52

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80. Vibration Pad Material

Kerfoot Co.—Illustrated bulletin EH-702 relates how transmission of vibration and noise can be controlled in most machinery and equipment applications without bolting to the floor. How? Through use of Elasto-Rib isolation pad material. Bulletin gives loading limits and shows five typical applications.

81. Machines & Tools

Ex-Cell-O Corp.—This is Ex-Cell-O is 4-page illustrated folder that depicts plants and products of this company. Precision machines and tools shown include grinding machines and equipment, transfer machines, boring and lapping units, cutting tools, drill bushings and aircraft parts.

82. Plastic Fire Brick

Laclede Christy Co.—A wealth of information is contained in 44-page illustrated catalog "The Inside Story of Plastic Fire Brick." Advantages, accessories, manufacture, installations, applications and specialties are covered. Cross-sectional drawings, tables and graphs are used to present much information and engineering data.

83. Grinding Case Histories

Gardner Machine Co.—In the 8 illustrated pages of this bulletin you will find articles on grinding clutch facings and brake linings on Gardner grinders, grinding parallel surfaces of large diameter thin rings and grinding of nonmetallic materials. 'Tis interesting and enlightening.

84. Die Steels

Latrobe Electric Steel Co.—"The Selection and Use of Deoxidized Hi Carbon Hi Chromium Die Steels" is title of 4-page illustrated brochure. Wear resistance, toughness and size rigidity for various grades is given, along with general data and analysis. Graphs show izod impact strength and hardness of each with specified treatments.

85. Roller Gravity Conveyor

Lawson Corp.—Consisting of 28 pages and many illustrations, catalog 612 presents the full line of roller gravity conveyors with information on proper selection. Specification data, construction characteristics, accessories available and illustrations of a number of applications are included. Catalog is plastic-bound and complete.

86. Cone-Drive Gears

Michigan Tool Co.—Cone-Drive Gears Div.—Sixteen illustrated bulletins 501-505, 507-517 and 522 deal with geared drives requiring simple and compact high load capacity, double enveloping gear sets and speed reducers or torque amplifiers.

EDITORIAL REPRINTS:

87. Machinability of Metals

Basic principles and underlying laws governing the cutting and machining of metals are gradually being put to work to solve tough machining problems. R. K. Gould in STEEL reprint "Machinability Theory Pays Off," covers some of these principles and discusses types of chips, the mechanical variables, tool wear, tool life and temperature, cutting fluids, alloying elements and high temperature alloys.

88. Precision Tube Production

Production of stainless tubing in sizes from 0.010 to 0.625-in. OD calls for close control of all operations—cold drawing, derodding and annealing. Special lubricants, controlled-atmosphere annealing, ammonia dissociation and temperature control are factors considered in STEEL reprint "Controls Ease Precision Tube Problems" by P. V. Fly of Tube Methods Inc.

89. Reducing Accidents

"Photographs Sell Safety Program" is title of STEEL feature which tells how W. W. Hall, safety supervisor at Crucible Steel Co., is 'shooting' his way to lower accident frequency with a camera. On-the-spot record of accidents and unsafe practices proves more effective than discussion in sounding the safety keynote.

90. Steel Consumer Problems

How is a medium-sized steel consumer faring these days? STEEL reprint headlined "Life with Champion of Champion Rivet" takes you to an interview with T. P. Champion for his opinions on the shortage of steel, rising material and labor costs and controls on both prices and materials.

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tories, Baltimore 2, Md. Most of the coatings will resist temperatures up to 1500 F and some up to 2000 F. The silicone-modified coatings may be sprayed, dipped or brushed on clean metallic surfaces.

Waterproofing Compound

USE REPLY CARD—CIRCLE No. 20

Sealbrite CRC-55, a completely dry and very thin waterproofing compound and rust preventative for long term protection of all metals is announced by London Chemical Co., Chicago 16, Ill. It forms a thin, tenacious film on metal surfaces that is dry to the touch, non-oily and nontacky. It may be removed with mineral spirits or any high flash solvent. It can be applied by dip, spray or brush.

Air Control Valve

USE REPLY CARD—CIRCLE No. 21

P-M line of Pilot Master valves announced by Hannifin Corp., Chicago 24, Ill., features a three-way solenoid valve for hazardous applications. Its principal use is for control of clutch and brake cylinders on mechanical presses where failure of a valve to reverse when solenoid is de-energized might result in injury to operator. Valves are designated as series B-3.

Repairs Casting Defects

USE REPLY CARD—CIRCLE No. 22

Casting defects can be repaired quickly on the spot with the Metasealer kit introduced by American Metaseal Corp., W. New York, N. J. It contains all materials, tools and supplies needed to repair defects in ferrous or nonferrous castings. Included is a plastic impregnant, a thermosetting plastic that seals castings flaws permanently, and won't shrink or corrode. It can be machined or finished with paint, lacquer or enamel; is resistant to solvents.

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Just circle the corresponding number of any item in this section for more information.

Cuts 100 hour packaging job to 40 hours!

This 60% savings in packaging time is only part of the story. Now that Whitin Machine Works — big name in textile machinery — has adopted Angier's vapor method of rust prevention, parts are stored or shipped *clean* to *stay* clean . . . always ready for instant use. What a savings in "degreasing" time and equipment.

One box of the bottom rollers shown above required a full hour to "clean". With a monthly average of 400 boxes, customers have been spared 10 man-weeks in labor costs. Meanwhile, Whitin now packages these rollers in six minutes instead of fifteen — a monthly total of 40 hours instead of 100.

Used here as a box liner, Angier VPI* Wrap gives off a protective vapor that permeates the area around shiny parts . . . it robs moisture and air of all rust-making power. VPI is such a simple way to store or ship metal that you, too, will discover impressive savings. Send today for facts that apply to your industry.

Angier

The Most Experienced Name in Vapor Rust Preventives

*R Vapor Rust Preventive

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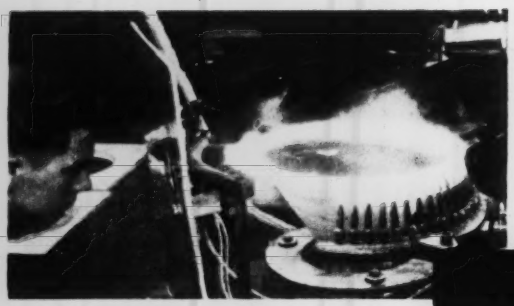
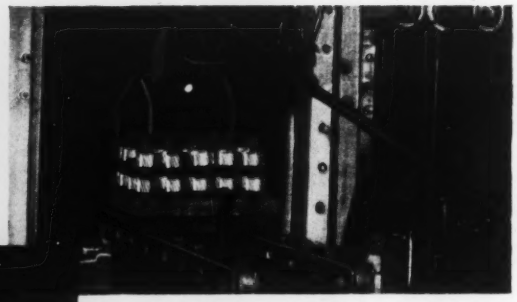
Please send "VPI Facts" as applied to:

- Machinery: Industrial, Metal Working, Farm, Office, Construction
- Electrical Machinery Appliances, Products
- Transportation Equipment: Auto, Aircraft, Naval, Railroad, etc.
- Fabricated Products
- Cutlery, Hardware, etc.
- Steel in process of fabrication
- Ordnance Equipment
- Instruments and clocks
- Other

Versatility of GAS in Industry





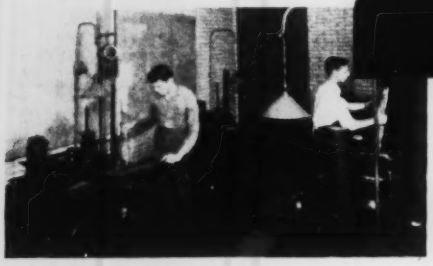
ELECTRONICS—Glass face of television tube is bonded to metal cone with automatic GAS equipment, assuring strong, vacuum-tight glass-to-metal bond, for large manufacturer of electronic equipment.

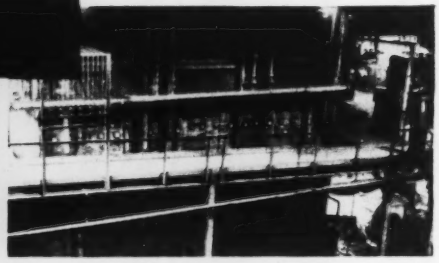
GRAPHIC ARTS—Monotype casters with Gas-fired metal pots, Linotype machines, smelters, ink dryers, stereocasters, etc. utilize the economical, versatile flames of Gas for printing in modern plants.

GAS... THE MODERN FUEL FOR ALL INDUSTRY

METALS—Gas meets rigid heat-processing requirements of production-line heat treatment, as in the case hardening of gears, for an automobile manufacturer, because Gas affords precise, automatic temperature control.

GLASS—Modern Industrial Gas Equipment is found throughout the glass industry—an example of which is this 100-ton continuous batch Gas-fired melting tank for making glass for a large industrial manufacturer.





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The Market Outlook

WHERE do we go from here? That's a common question come the first of September. Historically it's a favorite spot at which to pause and look ahead. It roughly marks the end of summer doldrums and the advent of weather conducive to action. It's the point where businessmen try to appraise how they will finish up a year.

To calculate what is ahead, take a look at today. Some of the things happening now will be an influence on what happens three or four months hence.

SIZING IT UP—Today the steel market is active but not hectic. It lacks the zip some people thought it would have after consumers had been starved for steel during the midsummer steelworkers' strike. Steel sales offices report more concern among buyers as to shipments on back orders than pressure to place new orders. A lack of interest in new ordering could mean a lowering of steel production in the winter months.

In another month the steel industry will have erased the defense order carryover that's responsible today for some of the pressure in the steel market. When the steel strike ended, the steel industry promised to catch up on defense orders by Nov. 30. Now it expects to do the job two months ahead of schedule. Indicative of this big push, one steel producer in the Pittsburgh area is shipping 63 per cent of its hot-rolled sheet output to fill orders of the military and converters.

AT THE TOP—Demand for steel varies with the product, the consumer and the locality, but almost without exception carbon bars and heavy plates are at the top of the tight list. The reason is they are used heavily in defense work. Part of the tightness in plates has been due to demand for cartridge cases. But now there is some reason to believe a slowdown in the program has been ordered.

No additional pressure is developing for carbon sheets and strip, although mills are booked full for the rest of the year. In some areas, hot-rolled and cold-rolled strip demand actually is sluggish.

CATCHING UP—Wire, a product that was in fairly easy supply before the steel strike, is moving in sufficient volume to consumers to indicate most mills' schedules will become current by November. A small amount of first-quarter tonnage has been ordered but there is no pressure to make forward commitments.

Structural shapes are in no great demand, largely because government restrictions prevent some types of construction.

CONVERSION TIMETABLE—With everyone trying to erase effects of the steel strike on his steel supply as quickly as possible and with the automobile industry setting high production goals, conversion steel is back into the picture. Conversion interest is expected to be intense through October, to taper off in November and perhaps become negligible in December. This timetable is based on rapid recovery of steelmaking from the strike.

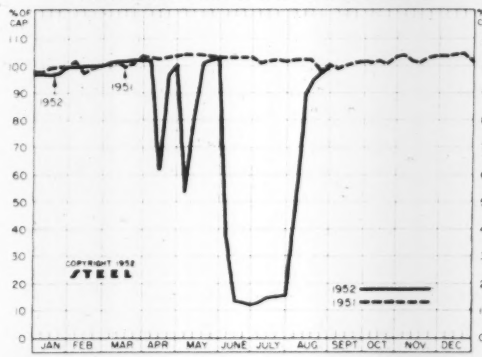
This snapback is one of the reasons the steel industry expects to become current on defense orders by Sept. 30. Another reason undoubtedly is that the industry wants to prove to the government that military orders will get preference, that government controls to assure it are not necessary.

HOPEFUL—The government is encouraged enough by the steel industry's performance to consider restoring a 45-day limitation on consumers' inventories of steel by Jan. 1. The limits were cut to 30 days because of the steel strike.

Reflecting the steel industry's production recovery, the rate of steelmaking in the week ended Aug. 30 edged up 1.5 points to 98.5 per cent of capacity.

INESCAPABLE—In planning for the future, consumers must reckon with higher costs of materials and labor. Steel producers continued last week to issue new and higher prices to compensate for the wage increase given the steelworkers. The government has not yet authorized a price increase for pig iron but there was speculation that a boost of $2 to $2.50 a ton may be okayed.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Aug. 30	Change	Same Week 1951	Same Week 1950
Pittsburgh	96.5	+ 1*	97.5	101
Chicago	101	+ 1.5*	103	93.5
Mid-Atlantic	95	+ 4	100.5	98.5
Youngstown	106	0	106	106
Wheeling	94.5	+ 1	97.5	97.5
Cleveland	104.5	+ 3*	101.5	92
Buffalo	104.5	+ 0.5	104	104
Birmingham	100	0*	100	100
New England	92	0	92	85
Cincinnati	70	- 20	101	103
St. Louis	90	- 14	87	80
Detroit	106	+ 1.5*	100	110
Western	107	- 3.5	102	102
Estimated national rate	98.5	+ 1.5	100	97.5

Based on weekly steelmaking capacity of 2,027,040 tons in 1952, 1,906,034 tons for 1951, 1,928,721 tons for second half 1950, 1,906,268 tons for first half 1950.

*Change from revised rate for preceding week.

The Metalworking Outlook—p. 45 Production Engineering News—p. 81

Composite Market Averages

	Aug. 28 1952	Week Ago	Month Ago	Year Ago	5 Yrs Ago
FINISHED STEEL INDEX, Weighted					
Index (1935-39 av. = 100)	181.10	181.10	173.02	173.02	120.39
Index in cents per lb.	4.314	4.314	4.637*	4.637	3.261
ARITHMETICAL PRICE COMPOSITES					
Finished Steel, NT	$113.23	$106.32	$106.12	$106.12	$75.41
No. 2 Fdry. Pig Iron, GT	52.94	52.94	52.94	52.94	37.06
Basic Pig Iron, GT	52.16	52.16	52.16	52.16	36.56
Malleable Pig Iron, GT	53.27	53.27	53.27	53.27	37.41
Steelmaking Scrap, GT	44.00	44.00	44.00	44.00	27.91

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p.54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

* Preliminary

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

	Aug. 28 1952	Week Ago	Month Ago	Year Ago	5 Yrs Ago
FINISHED MATERIALS					
Bars, H.R., Pittsburgh	3.50	3.50	3.50	3.50	2.50
Bars, H.R., Chicago	3.50	3.50	3.50	3.50	2.50
Bars, H.R. del. Philadelphia	4.302	4.302	4.252	4.29	3.28
Bars, C.F., Pittsburgh	4.925	4.925	4.85	4.85	3.50
Shapes, Std., Pittsburgh	3.50	3.50	3.65	3.65	2.80
Shapes, Std., Chicago	3.50	3.50	3.65	3.65	2.80
Shapes, del. Philadelphia	4.13	4.13	3.93	3.91	2.94
Plates, Pittsburgh	3.50	3.50	3.70	3.70	2.95
Plates, Chicago	3.50	3.50	3.70	3.70	2.95
Plates, Coatesville, Pa.	4.35	4.35	4.15	4.15	3.15
Plates, Sparrows Point, Md.	3.50	3.50	3.70	3.70	2.95
Plates, Claymont, Del.	4.35	4.35	4.15	4.15	3.15
Sheets, H.R., Pittsburgh	3.375	3.375	3.60 75	3.60 75	2.80
Sheets, H.R., Chicago	3.375	3.375	3.60	3.60	2.80
Sheets, C.R., Pittsburgh	4.325	4.325	4.35	4.35	3.50
Sheets, C.R., Chicago	4.325	4.325	4.35	4.35	3.50
Sheets, C.R., Detroit	4.325	4.325	4.55	4.55	3.70
Sheets, Galv., Pittsburgh	4.075	4.075	4.80	4.80	3.90
Strip, H.R., Pittsburgh	3.75 4.00	3.75 4.00	3.75 4.00	3.75 4.00	2.80
Strip, H.R., Chicago	3.225	3.50	3.50	3.50	2.80
Strip, H.R., Pittsburgh	5.10 5.50	5.10 5.50	4.65 5.35	4.65 5.35	3.55
Strip, C.R., Chicago	3.50	3.50	4.00	4.00	4.65
Strip, C.R., Detroit	4.65 5.60	4.65 5.60	4.85 5.60	4.85 5.60	3.70
Wire, Basc, Pittsburgh	4.85 5.225	4.85 5.225	4.85 5.10	4.85 5.10	3.675
Nails, Wire, Pittsburgh	5.00 6.35	5.00 6.35	5.00 6.20	5.00 6.20	4.25
Tin plate, box, Pittsburgh	$8.95	$8.95	$8.70	$8.70	$5.75
SEMIFINISHED					
Billets, forging, Pittsburgh	$70.00	$70.00	$66.00	$66.00	$46.00
Wire rods, Pittsburgh	4.325	4.325	4.10 50	4.10 50	2.925
PIG IRON, Gross Ton					
Bessemer, Pitts.	$53.00	$53.00	$53.00	$53.00	$37.00
Basic, Valley	52.00	52.00	52.00	52.00	36.00
Basic, del. Phila.	56.75	56.75	56.75	56.49	38.72
No. 2 Fdry., Pitts.	52.50	52.50	52.50	52.50	36.50
No. 2 Fdry., Chicago	52.50	52.50	52.50	52.50	36.00
No. 2 Fdry., Valley	52.50	52.50	52.50	52.50	36.50
No. 2 Fdry., del. Phila.	57.25	57.25	57.25	56.99	39.22
No. 2 Fdry., Birm.	48.88	48.88	48.88	48.88	34.88
No. 2 Fdry. (Birm.), del. Cin.	56.43	56.43	56.43	55.38	38.25
Malleable, Valley	52.50	52.50	52.50	52.50	36.50
Malleable, Chicago	52.50	52.50	52.50	52.50	36.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	66.00	44.00
Ferromanganese, Eddy, Pa.	225.00	225.00	188.00	188.00	140.25*

F.o.b. cars, Pittsburgh. †Preliminary.

SCRAP, Gross Ton (including broker's commission)					
No. 1 Heavy Melt., Pitts.	$44.00	$44.00	$44.00	$45.00	$28.00
No. 1 Heavy Melt., E. Pa.	43.00	43.00	43.50	43.00	27.00
No. 1 Heavy Melt., Chicago	42.00	42.00	42.00	43.00	28.75
No. 1 Heavy Melt., Valley	44.00	44.00	44.00	45.00	29.00
No. 1 Heavy Melt., Cleve.	43.00	43.00	43.00	44.00	27.50
No. 1 Heavy Melt., Det.	43.00	43.00	43.00	44.00	29.00
Rail, Rerolling, Chicago	52.00	52.00	52.00	52.00	40.25
No. 1 Cast, Chicago	50.00	48.00	45.00	45.00	43.00

* Nominal. †F.o.b. shipping point.

COKE, Net Ton					
Beehive, Furn., Connsv.	$14.75	$14.75	$14.75	$14.75	$11.50-12.50
Beehive, Fdry., Connsv.	17.00	17.00	17.00	17.00-18.00	15.00
Oven, Fdry., Chicago	23.00	23.00	23.00	23.00	17.00
NONFERROUS METALS					
Copper, del., Conn.	24.50	24.50	24.50	24.50	21.50
Zinc, E. St. Louis	14.00	14.00	15.00	17.50	10.00
Lead, St. Louis*	15.80	15.80	15.80	16.80-18.80	14.85
Tin, New York	121.50	121.50	121.50	105.00	80.00
Aluminum, del.	25.00	25.00	19.00	19.00	15.00
Antimony, Laredo, Tex.	39.00	39.00	39.00	42.00	32.00
Nickel, refinery, duty paid	36.50	36.50	36.50	36.50	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$55.50
NewYork, del.	....	58.28	58.78	....
Newark, del.	57.02	57.52	58.02	58.52
Philadelphia, del.	56.75	57.25	57.75	58.25
Birmingham District				
AlabamaCity, Ala. R2	48.38	48.88	....	....
Birmingham, R2	48.38	48.88	....	....
Birmingham, S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	56.43	....	....
Buffalo District				
Buffalo, R2	52.00	52.50	53.00	....
Buffalo, H1	52.00	52.50	53.00	....
Tonawanda, N.Y., W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y., T9	....	52.50	53.00	....
Boston, del.	62.65	63.15	63.65	....
Rochester, N.Y., del.	55.02	55.52	56.02	....
Syracuse, N.Y., del.	56.12	56.62	57.12	....
Chicago District				
Chicago, I-3	52.00	52.50	52.50	53.00
Gary, Ind., U5	52.00	....	52.50	....
IndianaHarbor, Ind., I-2	52.00	....	52.50	....
So. Chicago, Ill., W14	52.00	52.50	52.50	....
So. Chicago, Ill., Y1	52.00	52.50	52.50	....
So. Chicago, Ill., U5	52.00	....	52.50	53.00
Milwaukee, del.	54.17	54.67	54.67	55.17
Muskegon, Mich., del.	....	58.80	58.80	....
Cleveland District				
Cleveland, A7	52.00	52.50	52.50	53.00
Cleveland, R2	52.00	52.50	52.50	....
Akron, O., del. from Cleve.	54.61	55.11	55.11	55.61
Lorain, O., N3	52.00	....	....	53.00
Duluth, I-3	....	....	52.50	....
Erie, Pa., I-3	52.00	52.50	52.50	53.00
Everett, Mass., E1	....	59.75	60.25	....
Fontana, Calif., K1	58.00	58.50	....	....
Seattle, Tacoma, Wash., del.	....	60.66	....	....
Portland, Oreg., del.	....	60.66	....	....
LosAngeles, SanFrancisco, del.	60.16	60.66	....	....
GraniteCity, Ill., G4	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.65	55.15	55.65	....
Ironton, Utah, C11	52.00	52.50	....	....
Geneva, Utah, C11	52.00	52.50	....	....
LoneStar, Tex., L6	48.00	*48.50	48.50	....
Minnequa, Colo., C10	54.00	53.00	55.00	....
Pittsburgh District				
NevilleIsland, Pa., P6	....	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge				
Aliquippa, del.		53.87	53.87	54.37
McKeesRocks, del.		53.54	53.54	54.04
Lawrenceville, Homestead				
Wilmerding, Monaca, del.		54.16	54.16	54.66
Verona, Trafford, del.		54.69	54.69	55.19
Brackenridge, del.		54.95	54.95	55.45
Beemer, Pa., U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa., U5	52.00	....	....	....
McKeesport, Pa., N3	52.00	....	....	53.00
Monessen, Pa., P7	54.00	....	....	....
Sharpsville, Pa., S6	....	....	52.50	53.00
Steelton, Pa., B2	54.00	54.50	55.00	55.50
Swedeland, Pa., A3	56.00	56.50	57.00	57.50
Toledo, O., I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.47	57.97	....	....
Troy, N.Y., R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O., Y1	52.00	52.50	52.50	....
Youngstown, Y1	52.00	52.50	52.50	....
Youngstown, U5	52.00	....	....	53.00
Mansfield, O., del.	56.65	57.15	57.15	57.65

* Low phos, southern grade.

PIG IRON DIFFERENTIAL

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50%, no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O., G2, J1	$62.50
Buffalo, H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.04% max. P.)

NiagaraFalls, N.Y., P15	$88.00
Keokuk, Iowa, Openhearth & Fdry., frt. allowed, K2	92.50
Keokuk, OH & Fdry., 12¼ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., OH & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn., T3	$66.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa., B2	60.00
Philadelphia, delivered	63.56
Troy, N.Y., R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Aug. 28, 1952, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company, key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. A1 $81.00
Munhall,Pa. U5 74.00
Seattle N24 73.00
INGOTS, Alloy (NT)
Detroit R7 $82.00
Fontana,Calif. A1 81.00
Houston S5 82.00
Midland,Pa. C18 84.00
Munhall,Pa. U5 87.00
Seattle N24 80.00
BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 $59.00
Clairton,Pa. U5 59.00
Ensley,Ala. T2 59.00
Fairfield,Ala. T2 59.00
Fontana,Calif. A1 74.00
Gary,Ind. U5 59.00
Johnstown,Pa. B2 59.00
Lackawanna,N.Y. B2 59.00
Munhall,Pa. U5 59.00
Seattle B5 59.00
So.Duquesne,Pa. U5 59.00
Carbon, Forging (NT)
Bessemer,Pa. U5 $70.50
Buffalo R2 70.50
Canton,O. R2 70.50
Clairton,Pa. U5 70.50
Cleveland R2 70.50
Conshohocken,Pa. A3 77.50
Detroit R7 73.00
Ensley,Ala. T2 70.50
Fairfield,Ala. T2 70.50
Fontana,Calif. A1 80.50
Gary,Ind. U5 70.50
Geneva,Utah C11 70.50
Houston S5 74.00
Johnstown,Pa. B2 70.50
Lackawanna,N.Y. B2 70.50
Los Angeles B5 80.50
Munhall,Pa. U5 70.50
Seattle B5 80.50
So.Chicago,Ill. U5,W14 70.50
So.Duquesne,Pa. U5 70.50
So.Sanfrancisco B5 80.50
Alloy, Forging (NT)
Bethlehem,Pa. B2 $76.00
Buffalo R2 76.00
Canton,O. R2 76.00
Canton,O. E7 78.50
Conshohocken,Pa. A3 78.00
Detroit R7 76.00
Fontana,Calif. A1 98.00
Gary,Ind. U5 76.00
Houston S5 78.00
Ind.Harbor,Ind. Y1 76.00
Johnstown,Pa. B2 76.00
Lackawanna,N.Y. B2 76.00
Los Angeles B3 90.00
Massillon,O. R2 76.00
Midland,Pa. C18 76.00
Munhall,Pa. U5 76.00
So.Chicago,Ill. U5,W14 76.00
So.Duquesne,Pa. U5 76.00
Struthers,O. Y1 76.00
Warren,O. C17 76.00
ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 $87.50
Canton,O. R2 87.50
Cleveland R2 87.50
Fontana,Calif. A1 108.50
Gary,Ind. U5 87.50
Massillon,O. R2 87.50
So.Chicago,Ill. R2 87.50
So.Duquesne,Pa. U5 87.50
SHEET BARS (NT)
Fontana,Calif. A1 $94.18
SKELP
Aliquippa,Pa. J5 $3.65
Munhall,Pa. U5 3.55
Warren,O. R2 3.55
Youngstown R2, U5 3.55
WIRE RODS
Elton,Ill. L1 4.70
Alabama City,Ala. R2 4.325
Buffalo W12 4.10
Cleveland A7 4.325
Donora,Pa. A7 4.325
Fairfield,Ala. T2 4.325
Fontana,Calif. A1 5.15
Houston S5 4.50
Joliet,Ill. A7 4.325
Los Angeles B5 5.25
Minnequa,Colo. C10 4.35
Monessen,Pa. P7 4.30
No.Tonawanda,N.Y. B11 4.375
Pittsburg,Calif. C11 4.75
Puttnam,Ill. O P12 4.325
Rochling,N.J. R8 4.25
So.Chicago,Ill. R2 4.325
Sparrows Point,Md. B2 4.25
Sterling,Ill. U5 4.10
Struthers,O. Y1 4.25
Torrance,Calif. C11 5.25
Worcester,Mass. A7 4.625
SHEET STEEL PILING
Ind.Harbor,Ind. I-2 4.675
Lackawanna,N.Y. B2 4.675
Munhall,Pa. U5 4.675
So.Chicago,Ill. U5 4.675

STRUCTURALS
Carbon Steel Stand. Shapes
Alabama City,Ala. R2 3.85
Aliquippa,Pa. J5 3.85
Bessemer,Ala. T2 3.85
Bethlehem,Pa. B2 3.90
Clairton,Pa. U5 3.85
Fairfield,Ala. T2 3.85
Fontana,Calif. A1 4.45
Gary,Ind. U5 3.85
Geneva,Utah C11 3.85
Houston S5 4.05
Ind.Harbor,Ind. I-2 3.85
Johnstown,Pa. B2 3.90
Kansas City,Mo. S6 4.25
Lackawanna,N.Y. B2 3.90
Los Angeles B5 4.45
Minnequa,Colo. C10 4.30
Munhall,Pa. U5 3.85
Niles,Calif. (22) P1 4.85
Phoenixville,Pa. P4 5.00
Portland,Oreg. O4 4.50
Seattle B5 4.60
So.Chicago,Ill. U5,W14 3.85
So.Sanfrancisco B5 4.60
Torrance,Calif. C11 4.45
Weirton,W.Va. W6 3.90
Alloy Stand. Shapes
Clairton,Pa. U5 4.725
Fontana,Calif. A1 5.925
Munhall,Pa. U5 4.725
So.Chicago,Ill. U5 4.725
H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 5.80
Bessemer,Ala. T2 5.80
Bethlehem,Pa.(14) B2 5.80
Clairton,Pa. U5 5.80
Ensley,Ala. T2 5.80
Fontana,Calif. K1 6.10
Gary,Ind. U5 5.80
Geneva,Utah C11 5.80
Ind.Harbor,Ind. I-2 5.80
Ind.Harbor,Ind. Y1 6.60
Johnstown,Pa. B2 5.80
Lackawanna,N.Y. (14) B2 5.80
Los Angeles B5 6.45
Munhall,Pa. U5 5.80
Seattle B5 6.40
So.Chicago,Ill. U5 5.80
So.Sanfrancisco B5 6.50
Struthers,O. Y1 6.40
Wide Flange
Bethlehem,Pa. B2 3.90
Clairton,Pa. U5 3.85
Fontana,Calif. A1 4.85
Lackawanna,N.Y. B2 3.90
Munhall,Pa. U5 3.85
So.Chicago,Ill. U5 3.85
H.S., L.A. Wide Flange
Aliquippa,Pa. J5 5.50
Lackawanna,N.Y. B2 5.80
Munhall,Pa. U5 5.75
So.Chicago,Ill. U5 5.75
BEARING PILES
Munhall,Pa. U5 3.85
So.Chicago,Ill. U5 3.85
PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 5.90
Bessemer,Ala. T2 5.90
Clairton,Pa. U5 5.90
Cleveland J5, R2 5.90
Conshohocken,Pa. A3 6.00
Ecorse,Mich. G5 6.00
Fairfield,Ala. T2 5.90
Fontana,Calif. A1 6.55
Gary,Ind. U5 5.90
Geneva,Utah C11 5.90
Ind.Harbor,Ind. I-2 5.90
Ind.Harbor,Ind. Y1 6.65
Johnstown,Pa. B2 5.95
Munhall,Pa. U5 5.90
Pittsburgh J5 5.90
Seattle B5 6.85
Sharon,Pa. S7 5.95
So.Chicago,Ill. U5 5.90
Sparrows Point,Md. B2 5.95
Warren,O. R2 5.90
Youngstown R2, U5 5.90
PLATES, Open-Hearth Alloy
Claymont,Del. C22 5.35
Coatesville,Pa. L7 5.75
Conshohocken,Pa. A3 5.75
Fontana,Calif. A1 6.20
Gary,Ind. U5 5.25
Johnstown,Pa. B2 5.25
Munhall,Pa. U5 5.25
Sharon,Pa. S7 5.70
So.Chicago,Ill. U5 5.25
Sparrows Point,Md. B2 5.25
FLOOR PLATES
Cleveland J5 4.95
Conshohocken,Pa. A3 4.95
Ind.Harbor,Ind. I-2 4.95
Munhall,Pa. U5 4.95
So.Chicago,Ill. U5 4.95
PLATES, Ingot Iron
Ishland,(.15) H10 4.15
Ishland,(.18) H10 4.65
Cleveland J5, R2 4.50
Warren,O. R2 4.50
PLATES, Carbon Steel
Alabama City,Ala. R2 3.90
Aliquippa,Pa. J5 3.90
Ashland,Ky.(.15) H10 3.90
Bessemer,Ala. T2 3.90
Clairton,Pa. U5 3.90
Claymont,Del. C22 4.35
Cleveland J5, R2 3.90
Coatesville,Pa. L7 4.35
Conshohocken,Pa. A3 4.35
Ecorse,Mich. G5 4.45
Fairfield,Ala. T2 3.90
Fontana,Calif. A1 4.50
Gary,Ind. U5 3.90
Granite City,Ill. G4 4.60
Geneva,Utah C11 3.90
Harrisburg,Pa. C6 6.30
Houston S5 4.10
Ind.Harbor,Ind. Y1 5.00
Ind.Harbor,Ind. I-2 3.90
Johnstown,Pa. B2 3.90
Lackawanna,N.Y. B2 3.90
Minnequa,Colo. C10 4.10
Munhall,Pa. U5 3.90
Pittsburgh J5 3.90
Seattle B5 4.60
Sharon,Pa. S7 4.15
So.Chicago,Ill. U5,W14 3.90
Sparrows Point,Md. B2 3.90
So.Sanfrancisco B5 4.60
Youngstown R2, U5 3.90
PLATES, Carbon A-R
Fontana,Calif. A1 5.65
Geneva,Utah C11 5.65
PLATES, Wrought Iron
Economy,Pa. B14 8.00
Atlanta,Ill. A11 4.90
Niles,Calif. P1 5.05
Portland,Oreg. O4 4.65
SanFrancisco S7 4.55
BAR SIZE ANGLES, H.R Carbon
Bethlehem,Pa. B2 4.15
BARS, Hot-Rolled Carbon
Alabama City,Ala. R2 3.95
Aliquippa,Pa. J5 3.95
Elton,Ill. L1 4.50
Fontana,Calif. A1 4.50
Fairfield,Ala. T2 3.95
Buffalo R2 3.95
Canton,O. R2 3.95
Clairton,Pa. U5 3.95
Cleveland R2 3.95
Detroit R7 4.10
Ecorse,Mich. G5 4.10
Emeryville,Calif. J7 4.50
Fairfield,Ala. T2 3.95
Fontana,Calif. A1 4.50
Gary,Ind. U5 3.95
Houston S5 4.10
Ind.Harbor,Ind. Y1 4.95
Ind.Harbor,Ind. I-2 3.95
Johnstown,Pa. B2 3.95
Kansas City,Mo. S6 4.30
Lackawanna,N.Y. B2 3.95
Los Angeles B5 4.60
Milton,Pa. B6 4.05
Minnequa,Colo. C10 4.10
Niles,Calif. P1 4.65
Pittsburg,Calif. C11 4.45
Pittsburgh J5 3.95
Portland,Oreg. O4 4.65
Rochester,Pa. R3 4.00
Sacramento,Calif. J7 4.60
Fairfield,Ala. T2 3.95
Seattle B5 4.60
So.Sanfrancisco B5 4.60
Torrance,Calif. C11 4.45
Weirton,W.Va. W6 3.90
Youngstown R2, U5 3.90
BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 4.65
Buffalo R2 4.65
Canton,O. R2 4.65
Canton,O. E7 4.75
Clairton,Pa. U5 4.65
Detroit R7 4.85
Ecorse,Mich. G5 5.05
Fontana,Calif. A1 5.75
Gary,Ind. U5 4.65
Houston S5 4.70
Ind.Harbor,Ind. Y1 4.65
Ind.Harbor,Ind. I-2 4.65
Johnstown,Pa. B2 4.65
Los Angeles B5 5.25
Lackawanna,N.Y. B2 4.65
Los Angeles B5 5.25
Massillon,O. R2 4.65
Midland,Pa. C18 4.80
So.Chicago,R2,U5,W14 4.65
So.Duquesne,Pa. U5 4.65
Struthers,O. Y1 4.65
Warren,O. C17 4.65
Youngstown U5 4.65
BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 4.95
Gary,Ind. U5 4.95
Youngstown U5 4.95

BARS & SMALL SHAPES, H.R.
High-Strength Low-Alloy
Aliquippa,Pa. J5 5.95
Bessemer,Ala. T2 5.95
Clairton,Pa. U5 5.95
Cleveland R2 5.95
Ecorse,Mich. G5 6.05
Fairfield,Ala. T2 5.95
Fontana,Calif. A1 6.60
Gary,Ind. U5 5.95
Ind.Harbor,Ind. I-2 5.95
Indiana Harbor,Ind. Y1 6.65
Johnstown,Pa. B2 5.95
Lackawanna,N.Y. B2 5.95
Los Angeles B5 6.50
Pittsburgh J5 5.95
Sharon,Pa. S7 6.00
So.Chicago,Ill. U5,W14 5.95
Sparrows Point,Md. B2 5.95
Warren,O. C17 5.95
Youngstown R2, U5 5.95
BARS, Cold-Finished Carbon
Ambridge,Pa. W15 4.95
Beaver Falls,Pa. R2 4.95
Beaver Falls,Pa. M12 4.95
Buffalo B5 4.95
Camden,N.J. P11 5.05
Carnegie,Pa. C12 4.95
Chicago H15 4.95
Cleveland J7, C20 4.95
Detroit P17, R7 5.05
Donora,Pa. A7 4.95
Elyria,O. W8 4.95
Franklin Park,Ill. N5 4.95
Gary,Ind. R2 4.95
Green Bay,Wis. R7 4.95
Hammond,Ind. L2,M13 4.95
Hartford,Conn. R2 5.45
Harvey,Ill. I1, B5 4.95
Los Angeles R2 6.15
Mansfield,Mass. B8 5.45
Massillon,O. R8 4.95
Massillon,O. R2 4.95
Monaca,Pa. M7 4.95
Newark,N.J. W18 5.35
Plymouth,Mich. P6 5.15
Pittsburgh J5 4.95
Putnam,Conn. W18 5.45
Rockville,Mass. G14 5.45
St. Louis,Mo. M5 4.95
So.Chicago,Ill. W14 4.95
Springfield,Pa. K1 5.75
Struthers,O. Y1 4.95
Waukegan,Ill. A7 4.95
Youngstown Y1 4.95
Youngstown R7 4.95
BARS, Cold-Finished Alloy
Ambridge,Pa. W15 6.00
Beaver Falls,Pa. M12 6.40
Bethlehem,Pa. B2 6.00
Buffalo B5 6.00
Camden,N.J. P11 6.05
Canton,O. R2 6.00
Canton,O. T7 7.00
Carnegie,Pa. C12 6.40
Chicago H15 6.00
Cleveland A7 6.00
Cleveland,C20 6.00
Detroit P17, R7 6.15
Donora,Pa. A7 6.00
Gary,Ind. R2 6.00
Hammond,Ind. L2, M13 6.00
Hartford,Conn. R2 6.45
Harvey,Ill. I1, B5 6.00
Los Angeles R2 6.70
Mansfield,Mass. B8 6.00
Massillon,O. R2, R8 6.00
Monaca,Pa. M7 6.00
Newark,N.J. W18 6.35
Plymouth,Mich. P6 6.20
Putnam,Conn. W18 6.40
Rockville,Mass. G14 6.20
Springfield,Pa. K1 6.90
Struthers,O. Y1 6.00
Warren,O. C17 6.00
Worcester,Mass. A7 6.35
Ind.Harbor,Ind. Y1 6.00
Irvin,Pa. U5 5.70
Youngstown Y1 5.80
RAIL, STEEL BARS
Chicago Hts.(3.4) G2 4.75
Chicago Hts.(3.4) I-2 4.75
Franklin,Pa.(3.4) F5 4.75
Fort Worth,Tex.(26) T4 4.85
Huntingt'n,W.Va.(3) W7 5.80
Marion,O.(3) M21 4.75
Moline,Ill.(3.4) R12 4.75
Tonawanda(3.4) B12 4.75
Williamsport(3) S19 5.00
Williamsport(4) S19 5.10
BARS, Wrought Iron
Dover,N.J.(Staybolt) U1 15.00
Dover,Eng.Bar,Ill. U1 15.00
Dover,Wrgt.Iron U1 12.25
Economy,Pa.(S.R.) B14 9.60
Economy,Pa.(E.H.) B14 11.90
Economy,(Staybolt) B14 12.20
Mck.Rks.(staybolt) L5 14.50
Mck.Rks.(S.R.) L5 8.60
Mck.Rks.(E.H.) L5 13.00

BARS, Reinforcing (Fabricators)
Alabama City,Ala. R2 3.90
Elanta,Ill. A11 4.90
Buffalo R2 3.90
Cleveland R2 3.90
Emeryville,Calif. J7 4.70
Fairfield,Ala. T2 3.90
Fontana,Calif. A1 4.85
Gary,Ind. U5 3.90
Houston S5 4.10
Ind.Harbor,Ind. Y1 4.95
Ind.Harbor,Ind. I-2 3.90
Johnstown,Pa. B2 4.95
Kansas City,Mo. S6 4.30
Lackawanna,N.Y. B2 3.90
Los Angeles B5 4.85
Milton,Pa. B6 4.05
Minnequa,Colo. C10 4.75
Niles,Calif. P1 5.00
Pittsburg,Calif. C11 4.65
Pittsburgh J5 3.95
Seattle N14 4.45
Seattle B5 4.70
So.Chicago,Ill. R2 3.90
So.Duquesne,Pa. U5 3.90
So.Sanfrancisco B5 4.70
Sparrows Point,Md. B2 3.95
Struthers,O. Y1 3.95
Torrance,Calif. C11 4.65
Youngstown R2, U5 3.90
BARS, Reinforcing
(Fabricated by Consumers)
Huntington,W.Va. W7 5.50
Johnstown,Pa. B2 4.75
Los Angeles B3 5.45
Marion,O. P11 5.00
Seattle B3, N14 5.55
So.Sanfrancisco R3 5.45
Sparrows Point,Md. B2 4.75
Williamsport,Pa. S19 5.10
SHEETS, Hot-Rolled Steel
(18 gage and heavier)
Alabama City,Ala. R2 3.75
Ashland,Ky.(.18) H10 4.25
Butler,Pa. A10 3.75
Cleveland J5, R2 3.75
Conshohocken,Pa. A3 4.15
Detroit M1 4.10
Ecorse,Mich. G5 3.95
Fairfield,Ala. T2 3.75
Fontana,Calif. A1 4.25
Gary,Ind. U5 3.75
Geneva,Utah C11 3.85
Granite City,Ill. G4 4.50
Ind.Harbor,Ind. Y1 4.25
Ind.Harbor,Ind. I-2 3.75
Irvin,Pa. U5 3.75
Lackawanna,N.Y. B2 3.75
Munhall,Pa. U5 3.75
Niles,O. N12 5.25
Pittsburg,Calif. C11 4.45
Pittsburgh J5 3.75
Sharon,Pa. S7 4.15
So.Chicago,Ill. W14 3.75
Sparrows Point,Md. B2 3.75
Steubenville,O. H10 4.25
Torrance,Calif. C11 4.45
Warren,O. R2 3.75
Weirton,W.Va. W6 3.90
Weirton,Wheeling Pitts.A4 3.75
Youngstown Y1 4.25
Youngstown U5 3.75
SHEETS, H.R (19 gage)
Alabama City,Ala. R2 3.925
Dover,O. R1 4.85
Mansfield,O. E6 5.65
Niles,O. N12 5.75
Torrance,Calif. C11 5.55
SHEETS, H.R (14 ga., heavier)
High-Strength Low-Alloy
Cleveland J5, R2 5.675
Conshohocken,Pa. A3 6.25
Ecorse,Mich. G5 6.225
Fairfield,Ala. T2 5.675
Fontana,Calif. A1 6.65
Gary,Ind. U5 5.675
Ind.Harbor,Ind. I-2 5.675
Ind.Harbor,Ind. Y1 6.175
Irvin,Pa. U5 5.675
Lackawanna(5),N.J. B2 6.75
Middletown,O. A10 5.675
Niles,O. N12 5.675
Sharon,Pa. S7 5.675
So.Chicago,Ill. U5 5.675
Sparrows Point(16),Md. B2 5.675
Warren,O. R2 5.675
Weirton,W.Va. W6 5.75
Youngstown U5 5.675
Youngstown Y1 6.175
SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 6.925
Ecorse,Mich. G5 7.475
Fontana,Calif. A1 7.75
Gary,Ind. U5 6.925
Indiana Harbor,Ind. Y1 7.475
Indiana Harbor,Ind. I-2 6.925
Irvin,Pa. U5 6.925
Lackawanna(7),N.J. B2 6.925
Pittsburgh J5 6.925
Sparrows Point(18),Md. B2 6.925
Warren,O. R2 6.925

Weirton,W.Va. W6 ... 4.925
Youngstown Y1 ... 4.925

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. H10 ... 4.925
Cleveland,O. R2 ... 4.925
Detroit,Mich. M1 ... 4.925
Fairfield,Ala. T2 ... 4.925
Gary,Ind. U5 ... 4.925
Granite City,Ill. G4 ... 4.925
Ind.Harbor,Ind. Y1 ... 4.925
Middletown,O. A10 ... 4.925
Sparrows Point,Md. B2 ... 4.925
Warren,O. R2 ... 4.925
Weirton,W.Va. W6 ... 4.925
Youngstown Y1 ... 4.925

SHEETS, Galv'd No. 10 Steel

Butler,Pa. H10 ... 5.675
Ind.Harbor,Ind. Y1 ... 5.675
Irvin,Pa. U5 ... 5.675
Middletown,O. A10 ... 5.675
Portsmouth,O. P12 ... 5.675
Weirton,W.Va. W6 ... 5.675
Youngstown Y1 ... 5.675

SHEETS, Galv'd No. 10 High Strength Low Alloy

Ind.Harbor,Ind. Y1 ... 6.125
Middletown,O. A10 ... 6.125

SHEETS, Galvannealed Steel

Cleveland,O. R2 ... 6.025
Ind.Harbor,Ind. Y1 ... 6.025
Warren,O. R2 ... 6.025

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. H10 ... 5.675
Middletown,O. A10 ... 5.675

SHEETS, Electro Galvanized

Cleveland,O. R2 ... 6.025
Niles,O. N12 ... 6.025
Weirton,W.Va. W6 ... 6.025

SHEETS, Drum Body

Pittsburg,Calif. C11 ... 6.425
Torrance,Calif. C11 ... 6.425

SHEETS, Well Casing

Eastern Cities A1 ... 7.000

BLUED Stock, 29 ga.

Yorkville,O. H10 ... 7.000
Follansbee,W.Va. F4 ... 7.000
Steubenville,O. W12 ... 7.000

SHEETS, Enameling Iron

Ashland,Ky. A10 ... 4.925
Cleveland,O. R2 ... 4.925
Gary,Ind. U5 ... 4.925
Granite City,Ill. G4 ... 4.925

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J1	$7.65	$7.65	$8.05
Fairfield,Ala. T2	7.40	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
Granite City,Ill. G4	7.40	7.85	8.25
Indiana Harbor,Ind. I2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. N12	7.40	7.85	8.25
Weirton,W.Va. W6	7.40	8.40	8.80
Fairfield,Ala. T2	7.50	7.75	8.15
Sparrows Point,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.45	7.40	7.80
Yorkville,O. H10	7.40	7.65	8.05

SHEETS, SILICON, H R or C R (22 Ga. & lower) COILS (Cut lengths 12 ga. & lower)

	Field	Armature	Electric	Motor	Dynamo
Butler,Pa. H10 (cut lengths)			7.75	8.10	8.50
Brackenridge,Pa. A3			7.75	8.10	8.50
Granite City,Ill. G4 (cut lengths)			7.85	8.20	8.60
Indiana Harbor,Ind. I-2	7.55	7.85	8.10	8.45	
Mansfield,O. E6 (cut lengths)	7.10	7.35	7.65	8.00	8.50
Niles,O. N12 (cut lengths)		7.85	8.25		
Vandergrift,Pa. U4		8.50	8.85	9.00	9.40
Warren,O. R2		8.50	8.85	9.00	9.40
Zanesville,O. A10			8.85	9.00	9.40

SHEETS, SILICON (22 Ga. Base) COILS (Cut Lengths 12 ga. & lower)

	T2	65	58	52
Transformer Grade				
Butler,Pa. H10 (cut lengths)	11.40	11.70	11.70	12.50
Brackenridge,Pa. A3				
Granite City,Ill. G4	10.90	11.30	12.20	13.00
Warren,O. R2	10.90			
Zanesville,O. A10	11.40	11.70	12.20	13.00

H R or C R COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. H10 (C R)	11.50	11.80	12.35	13.35
Vandergrift,Pa. U4	11.50	11.80	12.35	13.35

Ind.Harbor,Ind. I-2 ... 4.925
Irvin,Pa. U5 ... 4.925
Middletown,O. A10 ... 4.925
Youngstown Y1 ... 4.925

BLACK PLATE (Base Box)

Butler,Pa. H10 ... $6.25
Fairfield,Ala. T2 ... 6.60
Gary,Ind. U5 ... 6.50
Granite City,Ill. G4 ... 6.50
Ind.Harbor,Ind. I-2 ... 6.50
Ind.Harbor,Ind. Y1 ... 6.50
Irvin,Pa. U5 ... 6.50
Niles,O. N12 ... 6.50
Pittsburg,Calif. C11 ... 7.25
Sparrows Point,Md. B2 ... 6.60
Warren,O. R2 ... 6.50
Weirton,W.Va. W6 ... 6.25
Yorkville,O. H10 ... 6.50

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4 ... 6.10
Gary,Ind. U5 ... 6.10
Steubenville,O. W12 ... 6.10
Warren,O. R2 ... 6.10
Weirton,W.Va. W6 ... 6.10
Youngstown Y1 ... 6.10

SHEETS, Galv'd No. 10 Steel

Ind.Harbor,Ind. Y1 ... 6.10
Irvin,Pa. U5 ... 6.10
Yorkville,O. H10 ... 6.10

SHEETS, Culvert

No. 16	Cu Alloy	Cu Fe
Ashland,Ky. A10	5.875	
Cleveland,O. R2	5.875	6.075
Fairfield,Ala. T2	5.875	6.125
Gary,Ind. U5	5.875	6.125
Ind.Harbor,Ind. I-2	5.875	6.125
Irvin,Pa. U5	5.875	6.125
Kokomo,Ind. (13) C16	6.25	
Middletown,O. A10	5.875	
Niles,O. N12	6.00	
Pittsburg,Calif. C11	6.625	
Sparrows Point,Md. B2	5.875	
Steubenville,O. W12	6.00	
Torrance,Calif. C11	6.625	

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10 ... 6.125
Fairfield,Ala. T2 ... 6.125
Middletown,O. A10 ... 6.125

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky. A10 ... 4.925
Cleveland,O. R2 ... 4.975
Ind.Harbor,Ind. I-2 ... 4.925
Warren,O. R2 ... 4.975

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. H10 ... 5.925
Cleveland,O. R2 ... 5.175
Middletown,O. A10 ... 5.925
Warren,O. R2 ... 5.175

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky. A10 ... 5.525
Warren,O. R2 ... 5.525

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. H10 ... 5.925
Middletown,O. A10 ... 5.925

SHEETS, ALUMINIZED

Butler,Pa. H10 ... 8.425

TINPLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J1	$8.70	$8.95
Fairfield,Ala. T2	8.50	8.95
Gary,Ind. U5	8.70	8.95
Granite City,Ill. G4	8.70	8.95
Ind.Harbor,Ind. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pittsburg,Calif. C11	9.45	9.70
Sparrows Point,Md. B2	8.80	9.05

Granite City,Ill. G4 ... 6.625

SHEETS, Galv'd No. 10 High Strength Low Alloy

Ind.Harbor,Ind. Y1 ... 6.675
Middletown,O. A10 ... 6.675

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky. A10 ... 4.975
Cleveland,O. R2 ... 5.025
Ind.Harbor,Ind. I-2 ... 4.975
Warren,O. R2 ... 5.025

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. H10 ... 5.975
Cleveland,O. R2 ... 5.225
Middletown,O. A10 ... 5.975
Warren,O. R2 ... 5.225

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky. A10 ... 5.575
Warren,O. R2 ... 5.575

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. H10 ... 5.975
Middletown,O. A10 ... 5.975

SHEETS, ALUMINIZED

Butler,Pa. H10 ... 8.475

TINPLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J1	$8.70	$8.95
Atlanta,Ill. A14	8.75	9.00
Gary,Ind. U5	8.70	8.95
Granite City,Ill. G4	8.70	8.95
Ind.Harbor,Ind. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pittsburg,Calif. C11	9.45	9.70
Sparrows Point,Md. B2	8.80	9.05

Warren,O. R2 ... 4.70
Weirton,W.Va. W6 ... 8.45 ... 8.70
Yorkville,O. H10 ... 8.70 ... 8.95

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2 ... $7.35
Gary,Ind. U5 ... 7.75
Irvin,Pa. U5 ... 7.75
Yorkville,O. H10 ... 7.75

SHEETS, LT. Coated Ternes, 8 lb

Yorkville,O. H10 ... $8.65

SHEET, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5 ... $9.75
Yorkville,O. H10 ... 9.75

SHEET, Long Terne Steel (Commercial Quality)

Brackenridge,Pa. A3, H10 ... 5.475
Gary,Ind. U5 ... 5.475
Mansfield,O. E6 ... 6.00
Middletown,O. A10 ... 5.475
Niles,O. N12 ... 6.00
Weirton,W.Va. W6 ... 5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ... 5.875

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5 ... 9.75

STRIP, Hot-Rolled High-Strength Low-Alloy

Beaver,Pa. B3 ... 5.65
Conshohocken,Pa. A3 ... 5.90
Coatesville,Pa. A3 ... 5.90
Ecorse,Mich. G5 ... 6.30
Fairfield,Ala. T2 ... 5.65
Fontana,Calif. K1 ... 6.55
Gary,Ind. U5 ... 5.65
Ind.Harbor,Ind. I-2 ... 5.65
Ind.Harbor,Ind. Y1 ... 6.15
Lackawanna,N.Y. B2 ... 5.65
Los Angeles(25),Calif. B3 ... 6.05
Seattle,Wash. B3 ... 6.30
Sharon,Pa. S5 ... 5.65
So.San Francisco(25),Calif. B3 ... 6.05
Sparrows Point,Md. B2 ... 5.70
Warren,O. R2 ... 5.65
Weirton,W.Va. W6 ... 5.75
Youngstown Y1 ... 6.15
Youngstown U5 ... 5.65

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland,O. R2 ... 7.45
Cleveland,O. A7 ... 7.30
Dover,O. G6 ... 7.30
Ecorse,Mich. G5 ... 8.15
Lackawanna,N.Y. B2 ... 7.90
Sharon,Pa. S5 ... 7.40
Sparrows Point,Md. B2 ... 7.90
Warren,O. R2 ... 7.30
Weirton,W.Va. W6 ... 7.20
Youngstown Y1 ... 7.80

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ... 3.725
Atlanta,Ill. A14 ... 4.20
Ashland,Ky. A10 ... 3.725
Atlanta,Ill. A14 ... 4.275
Bessemer,Ala. T2 ... 3.725
Bridgeprt.Conn.(10) S15 ... 4.225
Buffalo(27),N.Y. R2 ... 3.725
Butler,Pa. H10 ... 3.725
Cattaraugus,N.Y. S15 ... 4.00
Conshohocken,Pa. A3 ... 4.125
Detroit,Mich. M1 ... 4.40
Ecorse,Mich. G5 ... 4.025
Fairfield,Ala. T2 ... 3.725
Fontana,Calif. K1 ... 4.975
Gary,Ind. U5 ... 3.725
Houston,Tex. S5 ... 4.00
Ind.Harbor,Ind. I-2 ... 3.725
Ind.Harbor,Ind. Y1 ... 4.275
Johnstown,Pa.(25) B2 ... 3.725
Kansas City,Mo.(39) S5 ... 4.30
Lackawanna,N.Y.(32) B2 ... 3.725
Los Angeles B3 ... 4.475
Milton,Pa. B6 ... 4.35
Minnequa,Colo. C10 ... 4.775
New Britain,Conn.(10) S15 ... 4.225
No.Tonawanda,N.Y. B11 ... 3.725
Pittsburg,Calif. C11 ... 4.475
Riverdale,Ill. A1 ... 3.90
San Francisco S7 ... 4.50
Seattle B3 ... 4.725
Seattle N14 ... 4.50
Sharon,Pa. S5 ... 4.225
So.Chicago,Ill. W14 ... 3.725
So.San Francisco B3 ... 4.475
Sparrows Point,Md. B2 ... 3.725
Torrance,Calif. C11 ... 4.475
Warren,O. R2 ... 3.725
Weirton,W.Va. W6 ... 3.60
West Leechburg,Pa. A4 ... 3.75
Youngstown U5 ... 3.725
Youngstown Y1 ... 3.725

STRIP, Hot-Rolled Alloy

Bridgeprt.Conn.(10) S15 ... 6.05
Carnegie,Pa. S15 ... 5.80
Fontana,Calif. K1 ... 7.90
Gary,Ind. U5 ... 6.10
Houston,Tex. S5 ... 5.90
Kansas City,Mo. S5 ... 6.10
Midland,Pa. C18 ... 5.85
New Britn,Conn.(10) S15 ... 6.05
Sharon,Pa. S5 ... 6.45
Youngstown U5 ... 6.10

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6 ... 5.50
Berea,O. C7 ... 6.90
Bridgeprt.Conn.(10) S15 ... 5.80
Butler,Pa. H10 ... 5.40
Cleveland,A7 ... 5.10
Dearborn,Mich. D3 ... 6.05
Detroit,M2 ... 5.60
Detroit,M1 ... 5.45
Dover,O.(40) G6 ... 5.50
Ecorse,Mich. G5 ... 5.30
Fontana,Calif. K1 ... 6.75
Frankfort,Ill.(40) T6 ... 5.55
Harrison,N.J. C18 ... 5.50
Ind.Harbor,Ind. I-2 ... 5.35
Lackawanna,N.Y. B2 ... 5.10
Middletown,O. A10 ... 5.80
New Britain,Conn.(10) S15 ... 5.80
New Castle,Pa. B4 ... 5.80
New Castle,Pa.(40) E5 ... 5.20
New Haven,Conn. D2 ... 5.85
New Haven,Conn. A7 ... 5.60
Pawtucket,R.I. R3 ... 6.00
Pawtucket,R.I.(12) N8 ... 5.85
Riverdale,Ill.(40) A1 ... 4.90
Rome,N.Y. R6 ... 5.10
Sharon,Pa. S5 ... 5.80
Sparrows Point,Md. B2 ... 5.10
Trenton,N.J. R5 ... 6.45
Wallingford,Conn. W2 ... 5.85
Warren,O.(40) T5 ... 5.25
Warren,O. R2 ... 5.10
Weirton,W.Va. W6 ... 4.65
Youngstown O8 ... 5.25
Youngstown Y1 ... 5.10

STRIP, Electro Galvanized

Dover,O. G6 ... 5.50
Warren,O. T5 ... 5.25
Weirton,W.Va. W6 ... 4.65
Youngstown O8 ... 5.25

STRIP, Cold-Rolled Alloy Steel

Bridgeprt.Conn.(10) S15 ... 12.15
Carnegie,Pa. S18 ... 10.60
Cleveland,A7 ... 11.40
Dover,O. G6 ... 10.50
Fontana,Calif. K1 ... 13.05
Harrison,N.J. C18 ... 10.60
Midland,Pa. C18 ... 10.60
New Britn,Conn.(10) S15 ... 12.15
Pawtucket,R.I.(11) N8 ... 10.75
Pawtucket,R.I.(12) N8 ... 11.05
Sharon,Pa. S5 ... 12.00
Worcester,Mass. A7 ... 11.70
Youngstown O8 ... 10.60

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky. A10 ... 3.975
Warren,O. R2 ... 4.125

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 ... 5.70

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7		6.90	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
Bristol,Conn. W1			7.70	9.65	
Carnegie,Pa. S18		6.90	7.40	9.35	11.65
Cleveland,A7	5.10	7.30	8.25	10.20	12.50
Dearborn,Mich. D3	6.05	7.90	8.50		
Detroit,D2	6.45	7.50	8.10		
Dover,O. G6	5.50	6.90	7.40	9.35	11.65
Frankfort,Ill. T6	5.45	7.45	8.40	10.35	12.65
Harrison,N.J. C18			7.70	9.65	11.95
Mattapan,Mass. T6	5.95	7.60	8.55	10.50	12.80
New Britn,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
New Castle,Pa. B4	5.80	7.65	8.25	10.20	
New Castle,Pa. E5	5.50	6.90	7.40	9.35	11.65
New Haven,Conn. D2	6.70	7.60	8.20		
New York W3		7.95	8.55	10.50	12.80
Pawtucket,R.I. N8			7.70	9.65	
Reeve & Pitts Base		6.90	7.40	9.35	11.65
Worcester,Mass. Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S5	5.80	7.65	8.25	10.20	12.50
Trenton,N.J. R5		7.95	8.55	10.50	12.80
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	5.85	7.60	8.20	10.15	12.45
Worcester,Mass. T6	5.95	7.60	8.55	10.50	12.80
Youngstown O8		6.80	7.40	9.35	11.65

Spring Steel (Tempered)

Trenton,N.J. R5		10.50	12.50	15.25
Harrison,N.J. C18		10.30	12.50	15.35
New York W3		10.30	12.50	15.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Atlas Steel & Cleaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 Ameridan Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Buss & Laughlin Inc.
B6 Bourdi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Cannuel Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C14 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.
I-7 Indiana Steel & Wire Co

J1 Jackson Iron & Steel Co.
J2 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

TIGHT COOPERAGE HOOP

Atlanta, Ill.	4.85
Riverdale, Ill., A1	5.90
Sharon, Pa., S1	4.85
Youngstown, O.	4.15

WIRE, Tire Bead

Bartonville, Ill. (1), K4	10.50
Monessen, Pa., P16 (43)	11.40
Keeting, N.J., R5 (43)	11.55

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
Alabama City, Ala., R2	6.075	6.525
Aliquippa, J5	5.70	6.15
Atlanta, A11	6.525	6.675
Bartonville, Ill. (1), K4	5.70	6.15
Buffalo, W12	4.85	—
Cleveland, A7	6.075	6.45*
Crawfordsville, Ms	5.85	6.40
Donora, Pa., A7	6.075	6.45*
Duluth, Minn., A7	6.075	6.45*
Fairfield, T2	6.075	6.45*
Houston, Tex., S5	6.10	6.55
Johnstown, B2	6.075	6.45
Joliet, Ill., A7	6.075	6.45*
KansasCy, Mo., S5	6.00	6.75
Kokomo, Ind., C16	5.80	6.05
Los Angeles, B3	7.025	—
Minnequa, C10	5.95	6.45
Monessen, P7	5.95	6.40
Palmer, W12	5.45	—
Pitts., Calif., C11	7.025	7.40*
Prtsmth. (18), P12	6.475	—
Rankin, A7	6.075	6.45*
So. Chicago, R2	6.075	6.525
So. S. Fran., C10	6.65	7.10
Sparrows Pt., B2	6.475	6.55
Sterling, Ill. (1), N15	5.70	6.15
Struthers, O., Y1	6.075	6.475
Torrance, Cal., C11	7.025	—
Worcester, A7	6.375	6.75*

*Based on 14-cent zinc.

ROPE WIRE (A)

(Add 4.75 on base and extras)

Alton, Ill., L1	9.15
Bartonville, Ill., K4	8.55
Buffalo, W12	8.55
Fostoria, O., S1	8.85
Johnstown, Pa., B2	8.55
Monessen, Pa., P16	8.55
Munhall, Pa., P7	8.80
Muncie, Ind., I7	8.75
Palmer, Mass., W12	8.85
Portsmouth, O., P12	8.55
Roebling, N.J., R5	8.85
Sparrows Pt., B2	8.65
Struthers, O., Y1	8.85
Worcester, H6, T6	8.85

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Manufacturers Bright, Low Carbon

Alabama City, Ala., R2	5.225
Aliquippa, Pa., J5 (42)	4.85
Atlanta, A11	5.475
Alton, Ill., L1	5.45
Bartonville, Ill. (1), K4	4.85
Buffalo, W12	4.85
Chicago, W13	5.10
Cleveland, A7, C20	5.225
Crawfordsville, Ind., Ms	5.10
Donora, Pa., A7	5.225*
Duluth, Minn., A7	5.225
Fairfield, Ala., T2	5.225
Fostoria, O. (24), S1	5.35
Houston, S5	5.25
Johnstown, Pa., B2	5.225
Joliet, Ill., A7	5.225
KansasCity, Mo., S5	5.45
Kokomo, Ind., C16	4.95
Los Angeles, B3	6.175
Minnequa, Colo., C10	5.10
Monessen, Pa., P7	5.10
Newark, N.J., ga. 4-1	5.50
Va. Tonganoxie, B11	5.225
Palmer, Mass., W12	5.15
Pittsburg, Calif., C11	6.175
Portsmouth, O., P12	5.625
Rankin, Pa., A7	5.225
So. Chicago, Ill., R2	5.225
So. SanFrancisco, C10	5.80
Sparrows Pt., M1, B2	5.225
Sterling, Ill. (1), N15	4.85
Struthers, O., Y1	5.225
Torrance, Calif., C11	6.175
Waukegan, Ill., A7	5.225
Worcester, Mass., A7	5.525

WIRE, Cold-Rolled Flat

Anderson, Ind., G6	6.20
Buffalo, W12	6.35
Cleveland, A7 (43)	5.85
Crawfordsville, Ind., Ms	6.20
Dover, O., G6	6.20
Fostoria, O., S1	6.00
Kokomo, Ind., C16	5.20
Franklin Park, Ill., T6 (44)	6.20
Massillon, O., R8 (45)	5.85
Monessen, Pa., P16 (43)	6.35
Monessen, Pa., P7	6.10
Pawtucket, R.I. (12), N8,	6.85
Trenton, N.J., R5 (44)	6.15
Worcester, Mass., A7 (43)	6.15
Worcester, Mass., T6 (45)	6.50
Worcester, Mass., W12	6.65

WIRE, Galv'd ACSR for Cores

Bartonville, Ill., K4	8.50
Monessen, Pa., P16 (43)	8.50
Muncie, Ind., I7 (43)	8.70
Roebling, N.J., R5 (43)	8.80
Sparrows Pt., M1, B2 (43)	8.60
Johnstown, Pa., B2 (43)	8.50

WIRE (16 gage) Anl'd. Stone — Galv. Stone

(Add 4.75 on base and extras)

Aliquippa, J5	10.15	12.15
Bartonville, Ill., K4	10.25	11.95
Cleveland, A7	10.25	12.00*
Crawfordsville, Ms	10.30	12.00
Fostoria, O., S1	10.40	11.90
Johnstown, B2	*10.25*	*12.15*
Kokomo, C16	10.25	11.95
Minnequa, C10	10.40	12.10
Palmer, Mass., W12	10.25	12.15
Pitts., Cal., C11	10.60	12.35*
Sparrows Pt., B2	*10.45*	*12.25*
Waukegan, A7	10.25	12.00*

*Based on 14-cent zinc.

WIRE, MB Spring, High Carbon

Aliquippa, Pa., J5	6.25
Alton, Ill., L1	6.85
Bartonville, Ill. (1), K4	6.25
Buffalo, W12	6.25
Cleveland, A7 (43)	6.25
Donora, Pa., A7 (43)	6.25
Duluth, Minn., A7 (43)	6.25
Fostoria, O., S1	6.25
Johnstown, Pa., B2 (43)	6.25
Los Angeles, B3	7.20
Millbury, Mass. (12), N8	8.05
Monessen, Pa., P7, P16	6.25
Muncie, Ind., I7 (43)	6.45
Palmer, Mass., W12	6.35
Pittsburg, Calif., C11 (43)	7.20
Roebling, N.J., R5 (43)	6.55
Portsmouth, O., P12 (43)	6.25
So. Chicago, Ill., R2 (43)	6.25
So. SanFrancisco, C10	7.20
Sparrows Pt., M1, B2 (43)	6.25
Struthers, O., Y1 (43)	6.25
Trenton, N.J., R7 (43)	6.55
Waukegan, Ill., A7 (43)	6.25
Worcester, Mass., A7	6.575

WOVEN FENCE 9-15½ Ga Col.

Alabama City, Ala., R2	116
Ala City, Ala., I7 15ga., R2	122
Aliquippa, Pa. 9-14½ ga., J5	131
Atlanta, A11	140
Bartonville, Ill. (19), K4	131
Crawfordsville, Ind., Ms	133
Donora, Pa., A7	138*
Duluth, Minn., A7	138*
Fairfield, Ala., T2	138*
Houston, Tex., S5	139
Johnstown, Pa., B2	148
Johnstown, Pa., ga. 6, B2	229
Joliet, Ill., A7	138*
KansasCity, Mo., S5	143
Kokomo, Ind., C16	133
Minnequa, Colo., C10	139
Monessen, Pa., P7	136
Pittsburg, Calif., C11	161*
Rankin, Pa., A7	138*
So. Chicago, Ill., R2	135
Sterling, Ill. (1), N15	131

*Based on 14-cent zinc.

FENCE POSTS

Chicago Hts., Ill., C2	140
Duluth, Minn., A7	133
Franklin, Pa., F5	140
Huntington, W.Va., W7	140
Johnstown, Pa., B2	146
Joliet, Ill., A7	147*
Marion, O., P11	140
Minnequa, Colo., C10	139
Moline, Ill., R2	136
So. Chicago, Ill., R2	140
Tonawanda, N.Y., B12	140
Williamsport, Pa., S19	150

TRACK BOLTS (20) Treated

KansasCity, Mo., S5	9.85
Lebanon, Pa. (31), B2	9.85
Minnequa, Colo., C10	9.85
Pittsburgh, O3, P14	9.85
Seattle, R3	10.35

AXLES

Int'l Harbor, Ind., S11	5.65
Johnstown, Pa., B2	5.65

NAILS, Stock

To dealers & mfrs. (7)	Col.
Alabama City, Ala., R2	118
Atlanta, A11	128
Bartonville, Ill. (19), K4	123
Crawfordsville, Ind., Ms	132
Donora, Pa., A7	132
Duluth, Minn., A7	132
Fairfield, Ala., T2	132
Joliet, Ill., A7	132
KansasCity, Mo., S5	135
Kokomo, Ind., C16	125
Minnequa, Colo., C10	128
Pittsburg, Calif., C11	156
So. Chicago, Ill., R2	132
So. SanFran., Calif., C10	147
Sparrows Point, M1, B2	134
Sterling, Ill. (1), N15	123

WIRE, Upholstery Spring

Aliquippa, Pa., J5	5.50
Alton, Ill., L1	6.50
Buffalo, W12	5.90
Cleveland, A7	6.275
Donora, Pa., A7	6.275
Duluth, Minn., A7	6.275
Johnstown, Pa., B2	6.275
Monessen, Pa., P16 (42)	6.40
NewHaven, Conn., A7	6.575
Palmer, Mass., W12	6.20
Pittsburg, Calif., C11	7.225
Portsmouth, O., P12	6.275
Roebling, N.J., R5	6.575
So. Chicago, Ill., R2	6.275
So. SanFrancisco, C10	6.85
Sparrows Point, M1, B2	6.275
Torrance, Calif., C11	7.225
Trenton, N.J., A7	6.575
Waukegan, Ill., A7	6.275
Worcester, Mass., A7	6.575

WOVEN FENCE 9-15½ Ga Col.

Alabama City, Ala., R2	116
Ala City, Ala., I7 15ga., R2	122
Aliquippa, Pa. 9-14½ ga., J5	131
Atlanta, A11	140
Bartonville, Ill. (19), K4	131
Crawfordsville, Ind., Ms	133
Donora, Pa., A7	138*
Duluth, Minn., A7	138*
Fairfield, Ala., T2	138*
Houston, Tex., S5	139
Johnstown, Pa., B2	148
Johnstown, Pa., ga. 6, B2	229
Joliet, Ill., A7	138*
KansasCity, Mo., S5	143
Kokomo, Ind., C16	133
Minnequa, Colo., C10	139
Monessen, Pa., P7	136
Pittsburg, Calif., C11	161*
Rankin, Pa., A7	138*
So. Chicago, Ill., R2	135
Sterling, Ill. (1), N15	131

*Based on 14-cent zinc.

FENCE POSTS

Chicago Hts., Ill., C2	140
Duluth, Minn., A7	133
Franklin, Pa., F5	140
Huntington, W.Va., W7	140
Johnstown, Pa., B2	146
Joliet, Ill., A7	147*
Marion, O., P11	140
Minnequa, Colo., C10	139
Moline, Ill., R2	136
So. Chicago, Ill., R2	140
Tonawanda, N.Y., B12	140
Williamsport, Pa., S19	150

TRACK BOLTS (20) Treated

KansasCity, Mo., S5	9.85
Lebanon, Pa. (31), B2	9.85
Minnequa, Colo., C10	9.85
Pittsburgh, O3, P14	9.85
Seattle, R3	10.35

AXLES

Int'l Harbor, Ind., S11	5.65
Johnstown, Pa., B2	5.65

NAILS, Stock

To dealers & mfrs. (7)	Col.
Alabama City, Ala., R2	118
Atlanta, A11	128
Bartonville, Ill. (19), K4	123
Chicago, Ill., W13	118
Cleveland, A9	125
Crawfordsville, Ind., Ms	132
Donora, Pa., A7	127
Duluth, Minn., A7	127
Fairfield, Ala., T2	127
Galveston, Tex., D7	132
Houston, Tex., S5	126
Johnstown, Pa., B2	127
Joliet, Ill., A7	127
KansasCity, Mo., S5	130
Kokomo, Ind., C16	120
Minnequa, Colo., C10	123
Monessen, Pa., P7	124
Pittsburg, Calif., C11	146
Portsmouth, O., P12	132
Rankin, Pa., A7	127
So. Chicago, Ill., R2	118
Sparrows Point, M1, B2	129
Sterling, Ill. (1), N15	118
Torrance, Calif., C11	147
Worcester, Mass., A7	133

STAPLES, Polished, Stock

To dealers & mfrs. (7)	Col.
Alabama City, Ala., R2 (44)	118
Atlanta, A11	128
Donora, Pa., A7	126
Duluth, Minn., A7	126
Fairfield, Ala., T2	126
Joliet, Ill., A7	126
Pittsburg, Calif., C11	145
Portsmouth, O., P12	132
Rankin, Pa., A7	126
Sparrows Point, M1, B2	129
Torrance, Calif., C11	146
Worcester, Mass., A7	132

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken, Pa., A3	$7.80
Wheeling, W.Va., W10	7.80

TIE PLATES

Fairfield, Ala., T2	4.775
Gary, Ind., U5	4.775
Ind. Harbor, Ind., I-2	4.775
Lackawanna, N.Y., B2	4.775
Minnequa, Colo., C10	4.925
Pittsburg, Calif., C11	4.925
Seattle, B4	4.925
Steelton, Pa., B2	4.775
Torrance, Calif., C11	4.925

JOINT BARS

Bessemer, Pa., U5	4.925
Fairfield, Ala., T2	4.925
Ind. Harbor, Ind., I-2	4.925
Joliet, Ill., U5	4.925
Lackawanna, N.Y., B2	4.925
Minnequa, Colo., C10	4.925
Steelton, Pa., B2	4.925

STANDARD TRACK SPIKES

Int'l Harbor, Ind., Y1	6.65
Ind. Harbor, Ind., I-2	6.65
KansasCity, Mo., S5	6.40
Lebanon, Pa., B2	6.65
Minnequa, Colo., C10	6.65
Pittsburgh, Pa.	6.65
Seattle, B4	7.15
So. Chicago, Ill., R2	6.65
Struthers, O., Y1	6.65
Youngstown, R2	6.65

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb & Under
Bessemer, Pa., U5	3.775	3.675	3.725	4.25
Ensley, Ala., T2	3.775			4.25
Fairfield, Ala., T2				4.25
Gary, Ind., U5	3.775	3.675	3.725	
Huntington, W.Va., W7				5.00
IndianaHarbor, Ind., I-2	3.775	3.675	3.725	
Johnstown, Pa., B2				(16) 4.25
Lackawanna, N.Y., B2	3.775	3.675		4.25
Steelton, Pa., B2	3.775	3.675		
Williamsport, Pa., S19				4.75

TOOL STEEL

(Prices subject to 4.75 increase)

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
Low Cr Hot Work	0.350
Hi-Carbon-Cr	0.650

Grade by Analysis

W	Cr	V	Co	
18	4	1		1.565
18	4	2		1.660
20	4	1	12	2.535
20	4	2	12	2.675
20	4	2	7	2.460
18	4	1	4	2.125
18	4	2	9	2.440
13.5	4	3		1.602
9	3.25	0.5		1.06

W	Cr	V	Mo	
6	4	1.5	5	0.96
6	4	3	6	1.190
1.5	4	1	8.5	0.810

Tool steel producers include A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H3, L3, M14, S8, V2 and V3.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, rate basis.
(8) 16 gage and heavier.
(9) 6 gage and heavier.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 ga. & lighter.
(14) Also wide flange beams.
(15) "Sy" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for galvanized.
(21) New Haven, Conn. base.
(22) Incl. San Francisco Bay area.
(23) 36 6/4 .56" wide.
(24) Deduct 0.20c. Incl. Utah & Ga.
(25) Bar mill bands.
(26) Reinforcing, mill, straight or fabricated, to consumers, 5 tons.
(27) Bar mill sizes.
(28) Reinforced.
(29) Add 0.40 per ton. Shipped mill to car for universal mill.
(30) Not annealed.
(31) Drill and punch edge.
(32) To jobbers, deduct 2%.
(33) 5% for cut lengths.
(34) 12" and narrower.
(35) 13" and wider.
(36) 24 gage & lighter, 60" & narrower.
(37) 24 gage & lighter, 48" & narrower.
(38) 45" and narrower.
(39) Lighter than 0.05" to 0.07" and heavier.
(40) 0.22" bolts.
(41) 5 to 10 car lengths.
(42) Plus 0.15c per 100 lb.
(43) Plus 4.75 on base and extras.
(44) Plus 4.00 per 100 lb.
(45) Plus 4.00 per 100 lb.

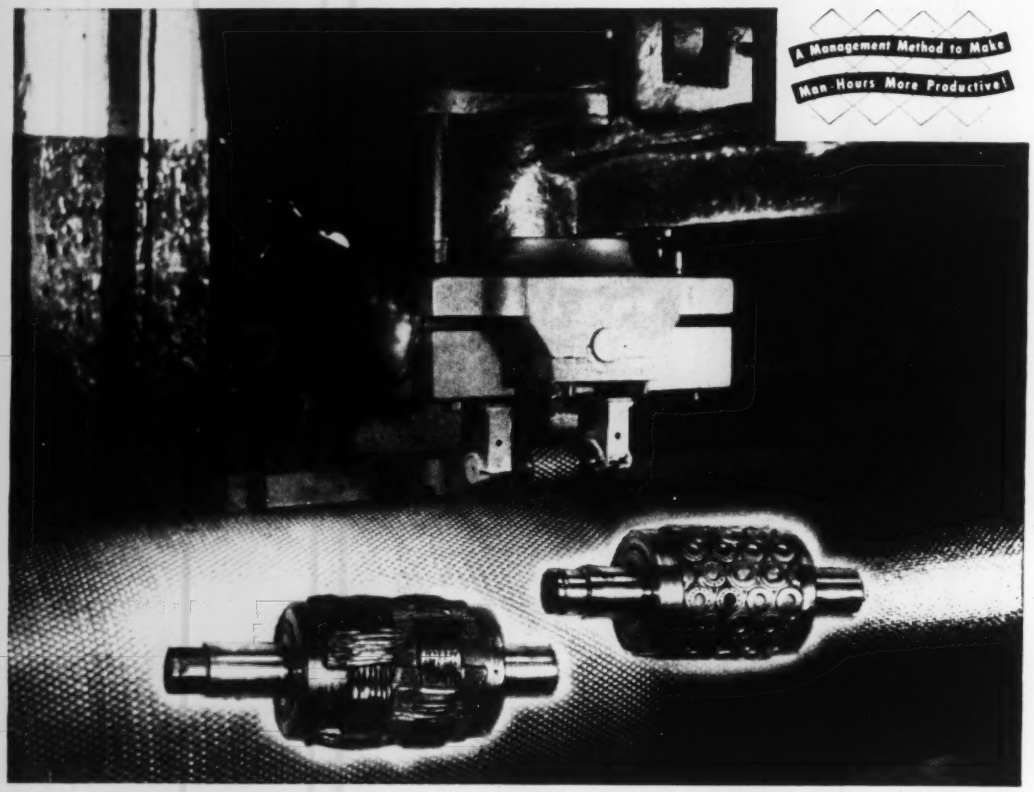
Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng-HighCarb Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Northwst. Steel Roll Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RellanceDiv., EatonMfg.
S1 Seneca Iron & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S24 Seidelhuber Steel
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Waltng Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West Auto Mach Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet & Tube



How to Put Delicate Patterns Through a 5-Ton "Wringer", Successfully

These knurling mills made from No. 11 Special Water-Hard Tool Steel press artistic patterns into large steel rolls for embossing cloth, paper and plastic. Here's what was required of the tool steel: It had to be hard enough to prevent upsetting, tough enough to prevent delicate edges from breaking under operating pressures up to 5 tons. Patterns on the mills were quite fragile and sections as deep as ⅛" could not collapse. Further, the steel had to heat treat with very little warpage.

But picking the proper steel wasn't as tough as you may imagine. For the Carpenter Matched Set Method not only indicated the one *best* steel for the job but enabled production management to "call its shots" . . . have the mills produce the required number of patterns on schedule, with less costly downtime.

For any plant making or using tools and dies, the Matched Set Method offers even more advantages than simplified selection. You benefit from lower tool steel inventories, heat treating economies, simplified toolroom and production procedures. To discover how it can work for you in your plant, write for the new booklet "How to Get Better Tool and Die Performance". THE CARPENTER STEEL CO., 139 W. Bern St., Reading, Pa.

Export Dept.: The Carpenter Steel Co.
Port Washington, N.Y. — "CARSTEELCO"

Carpenter

MATCHED TOOL & DIE STEELS

More than top-grade steels . . . a Method to keep tooling and production on schedule!

For your convenience, Carpenter carries warehouse stocks in principal cities throughout the country

STANDARD PIPE, T & C

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	B	C	Galvanized D	E	F
⅛	5.56	0.24	30.5	28.5		1.25	0.75	
¼	6.0	0.42	25	23		1.75	3.75	
⅜	6.0	0.57	20	18		5.5	7.5	
½	9.5	0.85	32.5	30.5	31.5	13.25	11.25	12.25
¾	11.5	1.13	35.5	33.5	34.5	17.25	15.25	16.25
1	17.0	1.68	38	36	37	20.75	18.75	19.75
1¼	23.0	2.28	38.5	36.5	37.5	20.5	18.5	19.5
1½	27.5	2.78	39	37	38	21.5	19.5	20.5
2	37	3.68	39.5	37.5	38.5	22	20	21
2½	58.5	5.82	40	38	39	21.75	19.75	20.75
3	76.5	7.62	40	38	39	21.75	19.75	20.75

Column A: Elma, Pa. N2 and 33½% on 3½", 4", Butler, Pa. ½-3½" F6, Benwood, W. Va. 1 point lower on ⅜", 1¼ points lower on ¼" and 2¼ points lower on ⅛". W10, Sharon, Pa. M6. 1 point higher on ¼", 2 points lower on ¾" and ⅜".

Following make ½" and larger: Lorain, O. N3, Youngstown R2 and 33½% on 3½" and 4"; Youngstown Y1, Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 20.5% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., Y1; Alton, Ill., (Gary base) 2 points lower discount L1.

Column D: Butler, Pa. F6. ⅛-⅜": Benwood, W. Va. W10, except plus ¼% on ⅜" plus 3½% on ¼", plus 7½% on ⅛" and 14½% on 3½" 4".

Elma, Pa. N2 and 14½% on 3½" 4". Following quote only on ½" and larger: Lorain, O. N3, Youngstown R2, and 14½% on 3½" and 4". Youngstown Y1.

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Galv. B	Elec. Weld Black C	Galv. D
2	37.00	3.68	24	6	24	6
2½	58.5	5.82	27	8.25	27	8.25
3	76.5	7.62	27	8.25	27	8.25
3½	92.0	9.20	29	10.25	29	10.25
4	$1.09	10.89	29	10.25	29	10.25
5	1.48	14.81	33.75	15	33.75	15
6	1.92	19.18	33.75	15	33.75	15

Column A: Aliquippa, J5; Ambridge, N2; Lorain, N3; Youngstown Y1.

Column B: Lorain, N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft., mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	C.D.	Elec. Weld H.R.	C.D.
1	13	14.10	17.17	16.20	16.20
1¼	13	16.97	20.70	16.46	19.19
1½	13	18.22	22.31	18.19	21.41
1¾	13	20.33	24.92	20.69	24.35
2	13	22.81	27.94	23.19	27.28
2¼	12	25.69	31.46	25.84	30.42
2½	12	28.40	34.78	28.46	33.60
2¾	12	31.28	38.31	31.19	36.67
3½	12	33.57	41.49	33.05	38.88
4	12	35.78	43.93	34.89	40.82

CLAD STEELS

(Cents per pound, subject to 4.7% increase on base price and extras)

Cladding Stainless	Plates — Carbon Base 10%	Plates — Carbon Base 20%	Strip — Cold-Rolled Carbon Base Both Sides 10%	Strip — Cold-Rolled Carbon Base Both Sides 20%	Sheets — Carbon Base 10%	Sheets — Carbon Base 20%	Cu Base Both Sides
302	....	....	....	....	19.75	26.24-27.50	77.00
304	25.00	29.50	....	....	24.50	27.50-27.77	77.00
309	36.50	35.00	....	....	....	....	....
310	36.50	41.00	....	....	....	....	144.00
316	29.50	34.00	....	....	26.00	35.92-36.50	....
317	34.50	39.00	....	....	....	....	....
318	33.50	38.00	....	....	....	....	....
321	26.50	31.00-32.00	....	....	23.00	33.00	111.00
347	27.50	32.00	....	....	24.00	33.50-33.83	130.00
405	21.25	27.75	....	....	....	....	....
410	20.75	27.25	....	....	....	....	....
Nickel	33.55	43.15	41.00	54.00	....	....	....
Inconel	41.23	54.18	....	....	....	....	165.00
Monel	34.93	46.28	....	....	....	....	....
Copper	....	....	23.70*	29.65*	....	44.00	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:

⅜-in. & smaller diam.	15
⅞-in. & ⅝-in.	18.5
¾-in. and larger	17.5

Longer than 6 in.:

All diams.	14

Lag bolts, all diams.:

6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire bolts	21
Boiler & Fitting-Up Bolts	31

NUTS

H.P. & C.P. Square:	Reg. Hvy.
½-in. & smaller	15 15
⅝-in. & ⅝-in.	12 6.5
¾-in.-1⅛-in.	9 1
1⅛-in. & larger	7.5 1
H.P. Hex.:	
½-in. & smaller	26 22
⅝-in. & ⅝-in.	16.5 6.5
¾-in.-1⅛-in.	12 2
1⅛-in. & larger	8.5 2
C.P. Hex.:	
½-in. & smaller	26 22
⅝-in. & ⅝-in.	23 17.5
¾-in. & 1⅛-in.	19.5 12
1⅛-in. & larger	12 6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ⅝-in.	29.5	22
¾-in.-1⅛-in.	24	15
1⅛-in. & larger	13	8.5
⅞-in. & larger		Light
⅞-in. & smaller		35
½-in. to ⅝-in.		28.5
⅝-in. to 1⅛-in.		26

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	45 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel, packaged; per cent off list)

6 in. or shorter:

⅜-in. & smaller	42
⅞-in. through 1 in.	34

Longer than 6 in.:

⅜-in. & smaller	26
⅞-in. through 1 in.	4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter 38

1 in. and smaller diam. x over 6 in. 26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

RIVETS

F.o.b. midwestern plants

Structural ⅝-in., larger 7.85c

⅞-in. under 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers—List to list-plus-$1

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plants)

GRAPHITE

Inches Diam.	Length	Cents per lb
17-18-20	60-72	17.85
8 to 16	48-60-72	17.85
7	48-60	19.57
6	48-60	20.95

CARBON

35-40	110	8.03
30	65-84-110	8.03
24	72 to 104	8.03
17 to 20	34-90	8.03

STAINLESS STEEL

(Add 4.7% on base price and extras)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	36.75	31.50
303	43.25	40.25	34.00
304	43.25	38.75	33.00
309	56.00	55.00	44.75
316	57.00	59.00	49.25
321	49.25	48.25	37.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Bait. Types 301-347 and 430 sheets, except 303 and 309: K2.

Brackenridge, Pa., sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410, bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 P2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Marshall, Pa., bars U5.

Muncie, Ind., wire I-7 quotes types 302, 304, 430.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars except 31.50c on Type 301 and 43.25c on 309 C4.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn. strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309, 316 sheets 42.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301 C8.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol 30.00-35.00

Toluol, one deg., 26.00-33.00

Industrial xylol . 25.00-33.50

Per ton bulk ovens

Sulphate of ammonia $32-$45

Cents per pound, ovens

Phenol, 40 (carlots, non-returnable drums) ... 17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh except as otherwise noted.)

	Cents
Sponge iron:	
98+% Fe, annealed	18.00
Unannealed	14.50
Swedish, c.i.f. New York, in bags	8.85-9.95
Electrolytic iron:	
Annealed, 99.5% Fe	42.50
Unannealed (99 + % Fe)	36.50
Unannealed, 99 + % Fe (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	33.00
Antimony, 500 lb lots	71.00
Brass, 20-ton lots	28.25-32.00
Bronze, 10-ton lots	51.25-60.00
Phosphor-Copper, 20-ton lots	80.00
Copper:	
Electrolytic	37.25
Reduced	34.75
Lead	22.50
Magnesium	75.00-85.00
Manganese:	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	86.00
Nickel Silver 5-ton lots	44.50
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302	83.00
Zinc, 10-ton lots	20.00-28.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	5.85
Less than 1000 lb	6.00
Molybdenum:	
99.9%, minus 200 mesh	3.24
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price net ton

BEEHIVE OVENS

Connellsvill fur.	$14.50-15.00
Connellsvill fdy.	16.50-17.50
New River foundry	20.50
Wise county, foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens	$22.75
Everett, Mass., ovens	
New England, del.	*24.50
Chicago ovens	22.00
Chicago, del.	24.50
Terre Haute, ovens	22.50
Milwaukee, ovens	23.75
Indianapolis, ovens	22.75
Chicago, del.	26.62
Cincinnati, del.	25.85
Detroit, del.	27.05
Ironton, O., ovens	22.50
Cincinnati, del.	25.12
Painesville, O., ovens	24.00
Cleveland, del.	25.82
Erie, Pa., ovens	23.50
Birmingham, ovens	20.30
Cincinnati, del.	25.23
Philadelphia, ovens	22.70
Nevillelsland Pa., ovens	23.00
Swedeland, Pa., ovens	22.60
St. Louis, ovens	
St. Louis, del.	25.40
Portsmouth, O., ovens	22.50
Cincinnati, del.	25.12
Detroit, ovens	24.00
Detroit, del.	25.90
Buffalo, del.	26.58
Flint, del.	26.73
Pontiac, del.	25.56
Saginaw, del.	27.08

*Or within $1.55 freight zone from works.

Freedom to Sell is Freedom to Buy

Eight decades ago 70% of all gainful workers in the U. S. A. toiled in agriculture. Today farms and factories, put together, account for less than 40%.

Where do the rest serve? Chiefly in distribution, which includes the physical movement of products to buyers, and all forms of selling, advertising and sales promotion at the manufacturing, wholesale and retail levels, as well as the widely varied services related to the maintenance and use of American products.

With over 60% of our total labor force falling outside of farm and factory employment, obviously salesmen on the front line of selling contribute greatly to the productivity, prosperity and the world's highest standard of living enjoyed by the U. S. A.

Without sales a business fails and jobs vanish. No matter how good a product may be, it must be sold in competition with other goods. A salesman sometimes finds his products not truly competitive. He then exercises tremendous pressures on his employer for better products, lower prices, or both. Thus, competitive selling greatly influences the progress of American prosperity.

Countries where selling is inefficient, restricted or eliminated generate far less wealth, happiness and security.

Competition, especially competitive selling, is a great American Freedom. Let us preserve it to assure Progress For All Our People.

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THE COMPETITIVE SYSTEM DELIVERS THE MOST TO THE GREATEST NUMBER OF PEOPLE

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140††*		Carbon	Floor
New York (city)	6.65	7.57	8.27‡	7.45		6.89	7.83	11.34‡	6.69	6.90	8.51
Boston (city)	6.71	7.55	8.74	6.75		6.48	7.74‡	10.80‡	6.76	7.00	8.18
Boston (c'try)	6.51	7.35	8.54	6.55		6.28	7.54‡	10.60‡	6.56	6.80	7.98
Phila. (city)	6.35	7.38	8.60	6.70	8.35	6.67	7.69	11.02	6.42	6.40	7.62
Phila. (c'try)	6.10	7.12	8.35	6.45	8.30	6.42	7.44	10.77	6.17	6.24	7.36
Balt. (city)	6.61	7.37	8.62	6.62		6.61	7.62‡	11.37	6.52	6.67	7.90
Balt. (c'try)	5.81	7.17	8.42	6.42		6.41	7.42‡	11.17	6.33	6.47	7.70
Norfolk, Va.	7.60	—	—	—		6.44	8.45		7.25	6.64	7.33
Richmond, Va.	6.14	6.95	8.68	6.53		6.20	7.38		6.58	6.68	7.80
Buffalo (del.)	6.00	6.85	8.66	6.41		6.10	7.68‡	12.27	6.28	6.50	7.87
Buffalo (whse)	5.80	6.65	8.46	6.21		5.90	7.48‡	12.07	6.08	6.30	7.67
Pitts. (whse)	5.80	—	8.45	5.97		5.83	6.90	10.65	5.95	6.12	7.18
Detroit (whse)	6.00-6.20	6.71-7.04	8.34	6.03-7.05	7.70-8.03	6.12-6.34	6.97§-7.41	10.92	6.42-6.65	6.19-6.85	7.52-7.72
Cleveland (del.)	6.00	6.85	8.39	6.20		6.09	7.19‡	10.99	6.53	6.37	7.72
Cleve. (whse)	5.80	6.65	8.19	6.00		5.89	6.99‡	10.79	6.33	6.17	7.52
Cincin. (city)	6.28	6.87	8.67	6.36		6.28	7.31	12.22	6.57	6.62	7.75
Chicago (city)	6.03	6.88	8.25	6.03		6.11	7.12‡	10.85	6.15	6.22	7.38
Chicago (whse)	5.83	6.68	8.05	5.83		5.91	6.92‡	10.65	5.95	6.02	7.18
Milwau. (city)	6.17	7.08	8.42	6.51		6.20	7.30‡	10.92	6.32	6.37	7.55
Milwau. (c'try)	5.97	6.88	7.22	6.31		6.00	7.10‡	10.82	6.12	6.17	7.35
St. Louis (del.)	6.30	7.15	8.55	6.68		6.33	7.40‡	11.15	6.55	6.60	7.78
St. L. (whse)	6.10	6.95	8.35	6.48		6.13	7.20‡	10.95	6.35	6.40	7.58
Birm'hm (city)	5.95	6.80	7.85‡	5.95		5.95	8.40		6.10	6.25	8.65
Birm'hm (whse)	5.80	6.65	7.70‡	5.80		5.80	8.40		5.95	6.10	8.85
Los Ang. (city)	6.78	8.65‡	9.95	6.94		6.77	8.84	12.25‡‡	6.84	6.91	9.10
L. A. (whse)	6.58	8.45‡	9.75	6.74		6.57	8.64	12.05‡‡	6.64	6.71	8.90
Seattle-Tacoma	7.43	9.26	9.55	7.90		7.40	9.56	10.90‡	6.83	7.24	9.07
SanFran.(whse)	7.02	8.37‡	9.70‡	7.23		6.81	8.83	12.20	6.79	6.84	8.95

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ add 25-cent special bar quality extra; § has rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; ²—500 to 1499 lb; ³—450 to 1499 lb.; ⁴—1600 to 1999 lb.

Ores

Lake Superior Iron Ore

(1952 prices not established; 1951 contract prices follow.)

Gross ton, 51½% (natural), lower lake ports.

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail, freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit del. E. Pa.

Foundry and basic 56-62% concentrates, contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 68-69% (spot)	32.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48%, nearby, $1.18-1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$39.00-42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00
South African Transvaal	
44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00
Brazilian	
44% 2.5:1 lump	nom.
Rhodesian	
45% no ratio	$29.00
48% no ratio	31.50-32.00
48% 3:1 lump	50.00-51.00
Domestic—rail nearest seller	
48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines	$1.00

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 21.75c per lb of contained Cr c.l., packed 22.65c, ton lot 23.85c, less ton 25.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.03% C 33.60c per lb of contained Cr, 0.04% C 31.50c, 0.06% C 30.50c, 0.10% C 30.00c, 0.15% C 29.75c, 0.20% C 29.50c, 0.50% C 29.25c, 1% C 29.00c, 1.50% C 28.85c, 2% C 28.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. S M x D, bulk, 23.25c per lb of contained Cr, C.l., packed 24.15c, ton 25.50c, less ton 27.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, S M x D, 16.35c per lb of alloy; ton lot 17.2c; less ton lot, 18.4c, delivered, spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 21.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 21.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 26-39%, Al 7-9%, C 0.05% max.) 21.75c per lb of contained silicon plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) Contract carload, 1" x D; packed, max 0.50% C grade, $1.08 per lb of contained chromium ton lot $1.10, less ton $1.12. Delivered. Spot, add 5c.

SILICON ALLOYS

25.30% Ferrosilicon: Contract, carload, lump, bulk, 20.00c per lb of contained Si, packed 21.40c; ton lot 22.50c. Niagara Falls freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe). C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 200 to 1999 lb 11.65c, smaller lots 12.15c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3.5-5% max). Contract, any quantity, $3.10 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.6-1% max), $3.20. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max), $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 85c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B), 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 10,000 lb W or more, $4.85 per lb of contained W; 2000 lb W to 10,000 lb W, $4.95; less than 2000 lb W, $5.07, f.o.b. Niagara Falls, N. Y.

*Government ceiling prices, effective May 7, 1951, f.o.b. Niagara Falls, N. Y., basis.

NOTE: Current prices on manganese, titanium and "other ferroalloys" appeared on page 161 Aug. 18 issue; briquetted alloys, page 143, Aug. 11; calcium and zirconium, alloys and refractories, page 173, Aug. 4.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952

STEELMAKING SCRAP COMPOSITE

Aug. 28	$43.00
Aug. 21	43.00
July, 1952	42.60
Aug., 1951	44.00
Aug., 1947	39.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin, and from which ceiling on bue and ceiling delivered prices are computed on scrap of railroad origin.

Grade 1 Basing Point	No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	42.00	43.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	42.00	43.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Monessen, Pa.	44.00	46.00
Monroe, Mich.	41.00	43.00
Moundsville, W. Va.	42.50	44.50
Pittsburg, Calif.	41.00	43.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	41.00	43.00
Portsmouth, O.	42.00	44.00
Sharpsville, Pa.	44.00	46.00
San Francisco	41.00	43.00
Seattle, Wash.	41.00	43.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O H and Blast Furnace Grade

2 No. 1 Bushelling	Base
3 No. 1 Heavy Melting	$1.00
4 No. 2 Heavy Melting	1.00
5 No. 2 Bundles	1.00
6 Machine Shop Turnings	10.00
7 Mixed Borings and Short Turnings	6.00
8 Shoveling Turnings	6.00
9 No. 2 Bushelling	4.00
10 Cast Iron Borings	6.00

Elec. Furnace and Ldry. Grades

11 Billet, Bloom & Forge Crops	+ 7.50
12 Bar Crops & Plate	+ 5.00
13 Cast Steel	+ 5.00
14 Punchings & Plate Scrap	+ 2.50
15 Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate	
16 3 feet and under	+ 3.00
17 2 feet and under	+ 5.00
18 1 foot and under	+ 6.00
19 Briquetted Cast Iron Borings	Base
Foundry Steel	
20 2 feet and under	Base
21 1 foot and under	+ 2.00
22 Springs and Crankshafts	+ 1.00
23 Axle Free Turnings	— 3.00
24 Heavy Turnings	— 1.00
25 Briquetted Turnings	Base
26 No. 1 Chemical Borings	— 3.00
27 No. 2 Chemical Borings	+ 4.00
28 Wrought Iron	+ 10.00
29 Shafting	+ 10.00
31 Old Tin & Terne Plated Bundles	— 10.00

Unprepared Grades

When compressed constitutes

32 No. 1 Bundles	— 6.00
33 No. 2 Bundles	— 9.00
34 Other than material suitable for hydraulic compression	— 8.00

Restrictions on Use

(1): Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer, otherwise ceiling prices shall not exceed prices established for grades 12 and 8, respectively.

(2): Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 1-0.

(3): Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4): Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces of foundries, or in basic O-H or blast furnace under NPA allocation or OPS authorization.

(5): Prices for Grade 29 may be charged only when sold for forging or welding purposes.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2 No. 2 Heavy Melting Steel	— $2.00
3 No. 2 Steel Wheels	Base
4 Hollow Bored Axles and Axles with keyways between the Wheelseats	Base
5 No. 1 Bushelling	3.00
6 No. 1 Turnings	— 3.00
7 No. 2 Turnings, Drillings & Borings	— 12.00
8 No. 2 Cast Steel and Cast Wheelcenters	— 6.00
9 Steel Rails, 36 Inches or Under	Base
10 Brake Tubes & Pipes	+ 8.00
11 Structural Wrought Iron and Steel, uncut	— 6.00
12 Destroyed Steel Cars	+ 8.00
13 No. 1 Steel Scrap	+ 9.50
14 Scrap Rails, Random Lengths	+ 2.00
15 Rerolling Rails, Cut Rails	+ 7.00
16 1 feet and under	+ 5.00
17 2 feet and under	+ 6.00
18 18 inches and under	+ 8.00
19 Cast Steel, No. 1	+ 5.00
20 Cut Tires	+ 2.00
21 Cut Tires	+ 5.00
Boilers & Side Frames, Uncut	Base
24 Cut	+ 3.00
24 Angles, Splice Bars & Plates	+ 5.00
25 Solid Steel Axles	+ 12.00
26 Steel Wheels, No. 3 Oversize	Base
27 Steel Wheels, No. 2	+ 5.00
28 Spring Steel	+ 5.00
29 Couplers & Knuckles	+ 5.00
30 Wrought Iron	+ 8.00
31 Fireboxes	8.00
32 Rollers	6.00
33 No. 2 Steel Scrap	13.00
34 Cupolas, Tools, Car Kads, cut apart	6.00
35 Sprocket Iron & Steel	6.00
36 Unprepared scrap, not suitable for hydraulic compression	— 8.00

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin, authorized by OPS are:

(1): For preparing into Grades No. 3, No. 4 or No. 2, $8.

(2): For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.

(3): For crushing Grade No. 6, $3.

(4): For preparing into Grade No. 25, $6.

(5): Grade No. 19, $6.

(6): Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.

(7): Grade No. 17 or No. 21, $11.

(8): Grade No. 18, $12.

(9): For hydraulically compressing Grade No. 25, $8.

(10): For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1): For preparing into Grade No. 3 and Grade No. 2, $8.

(2): For hydraulically compressing Grade No. 13, $6.

For preparing into:

(3): Grade No. 16, $4.

(4): Grade No. 17, $5.

(5): Grade No. 18, $7.

(6): Grade No. 21, $4.

(7): Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1): For preparing Grade No. 5 into Grade No. 7, $9.

(2): For preparing Grade No. 3 into Grade No. 11, $7.

(3): For preparing Grade No. 3 into Grade No. 1, $4.

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:

1 No. 1 (Cupola)	$59.00
2 No. 2 (Charging Box)	47.00
3 No. 3 (Hvy. Breakable)	45.00
4 No. 4 (Burnt Cast)	41.00
5 Cast Iron Brake Shoes	41.00
6 Stove Plate	46.00
7 Clean Auto Cast	52.00
8 Unstripped Motor Blocks	43.00
9 Wheels, No. 1	47.00
10 Malleable	55.00
11 Drop broken machinery	52.00

OPEN MARKET

Delivered prices include broker's commission.

Birmingham

(Delivered)

No. 1 cupola cast	$42.00
Stove plate	37.00
Charging box cast	36.00-40.00
Heavy breakable	36.00-37.00
Drop broken machinery	42.00-43.00
Unstripped motor blocks	35.00-38.00

Boston

(F.o.b. shipping point)

No. 1 cupola cast	40.00
Heavy breakable	36.00
Stove plate	34.00-35.00
Unstripped motor blocks	30.00

Buffalo

(Delivered)

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 1 bushelling	44.00
No. 2 bundles	43.00
Machine shop turnings	34.00
Mixed borings, turnings	38.00
Cast iron borings	38.00
Short shoveling turnings	38.00
No. 1 cupola cast	45.00-46.00
No. 1 machinery cast	46.50-47.50

Chicago

(Delivered)

No. 2 heavy melting	42.50
No. 2 bundles	42.50
Machine shop turnings	33.50
Mixed borings, turnings	37.50
Shoveling turnings	37.50
Cast iron borings	37.50
No. 1 cupola cast	49.00-51.00
Charging box cast	47.00-48.00
Heavy breakable	47.00-48.00
Burnt cast	41.00-42.00
Cast iron brake shoes	42.00-43.00
Stove plate	45.00-47.00
Clean auto cast	55.00-56.00
Unstripped motor blocks	39.00-40.00
Malleable	60.00-62.00
Drop broken machinery	55.00-57.00

Cleveland

(Delivered)

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 2 bundles	43.00
Machine shop turnings	34.00
Mixed borings, turnings	38.00
Shoveling turnings	38.00
Cast iron borings	38.00

(F.o.b. shipping point)

No. 1 cupola cast	49.00
Charging box cast	47.00
Burnt cast	41.00
Stove plate	46.00
Clean auto cast	52.00
Unstripped motor blocks	43.00
Malleable	55.00
Drop broken machinery	52.00

Detroit

(F.o.b. shipping point)

No. 1 cupola cast	49.00†
Heavy breakable	45.00†
Clean auto cast	52.00†
Unstripped motor blocks	43.00†
Drop broken machinery	52.00†
Charging box cast	47.00†

Ceiling price

Los Angeles

(Delivered)

No. 2 bundles	29.00
No. 1 cupola cast	42.00-44.00

New York

(Brokers' buying prices)

No. 2 heavy melting	35.00
Mixed borings, turnings	31.00
Machine shop turnings	27.00
Cupola cast	40.00-42.00
Unstripped motor blocks	36.00-37.00

Philadelphia

No. 1 heavy melting	41.50†
No. 2 heavy melting	41.50†
No. 1 bundles	42.50†
No. 2 bundles	41.50†
No. 1 bushelling	42.50†
Mixed borings, turnings	36.50†
Machine shop turnings	32.50†
Short shoveling turnings	36.50†
No. 1 cupola cast	46.00-48.00†
Unstripped motor blocks	41.00†
Heavy breakable	45.00†
Machinery cast	52.00†

Ceiling price †Nominal
‡Shipping point ††Delivered

Pittsburgh

(Delivered)

No. 2 heavy melting	44.00†
No. 1 bundles	45.00†
No. 2 bundles	44.00†
Machine shop turnings	35.00†
Shovel turnings	39.00†
No. 1 cupola cast	48.50
Heavy breakable	45.00

Ceiling price

San Francisco

(Delivered)

No. 2 bundles	30.00
No. 1 cupola cast	46.00

Seattle

(F.o.b. shipping point)

No. 1 cupola cast	44.00
Heavy breakable	40.00
Unstripped motor blocks	38.00

St. Louis

(Delivered)

No. 1 cupola	41.00
Unstripped motor blocks	39.00

Youngstown

(Delivered)

No. 2 heavy melting	43.00
No. 2 bundles	43.00
Machine shop turnings	34.00

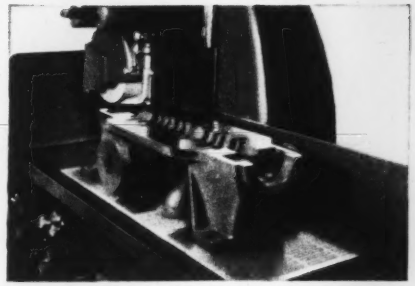
HAMILTON, ONT.

(Delivered Prices)

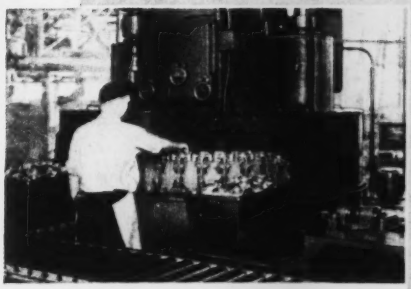
Heavy Melt	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	35.00
Mechanical Bundles	31.50
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	32.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new factory:	
Prep'd	33.00
Unprep'd	31.00
Short Steel Turnings	32.00
Cast Iron Grades†	
No. 1 Machinery Cast	50.00

F.o.b. shipping point.

WHERE THERE IS A FLAT SURFACE TO GRIND THERE'S A MATTISON TO GRIND IT.



40 hours before — now 4 hours. Pump case ground on Mattison Horizontal Spindle Precision Surface Grinder.



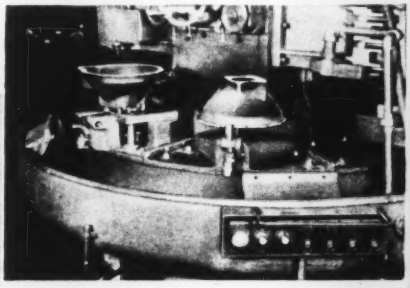
700 connecting rods per hour, using 40 station fixture to finish grind crank and wrist pin end of assembled rod with Mattison No. 72 Grinder.

With the addition of the production grinding machinery formerly made by the Hanchett Manufacturing Company, Mattison is now in a position to work with you on all your surface, face and disc grinding problems. These machines are made in various types to handle a wide range of work. Experienced engineers are available to give you best production efficiency, finish and tolerances, with Mattison machines.

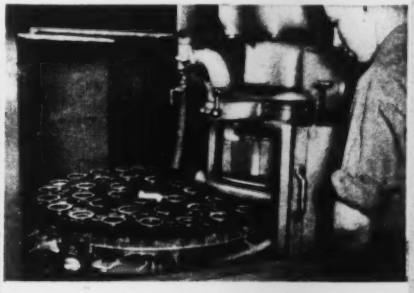
For any flat grinding ask for our recommendations on the proper method and machine for your job. No obligation, of course.

For catalogs on any of the types shown or if you would like a copy of the general bulletin, let us know and we'll gladly send them to you.

Grinding Cast-Iron Cams — 5" diameter, 1⅛" thick — stock removal, each side .030". Production 120 surfaces per hour on Mattison (Hanchett Type) Rotary Surface Grinder.



200 Transmission Case surfaces ground per hour on Mattison (Hanchett Type) Rotary Automatic Grinder. A special 8-station mechanical fixture permits one operator to grind each end of this large 35 lb. casting, flat and parallel. Stock removal .050".



320 surfaces of cast iron compression heads per hour, removing 1/32" stock with Mattison No. 24 Rotary Surface Grinder.

MATTISON MACHINE WORKS

ROCKFORD • ILLINOIS

every grade of ZINC

for urgent military and

civilian requirements

SLAB ZINC

PRIME WESTERN

SELECT

BRASS SPECIAL

INTERMEDIATE

HIGH GRADE

SPECIAL HIGH GRADE

AMERICAN ZINC SALES COMPANY

Distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, O. Chicago St. Louis New York

The Metal Market

Kickoff time for fall production drive is here. Outlook for supply of nonferrous metals is the brightest it has been for some time

LABOR DAY traditionally marks the kickoff of the fall production drive, and this year is no exception. Already things are looking up for a number of industries caught in the creeping summer paralysis.

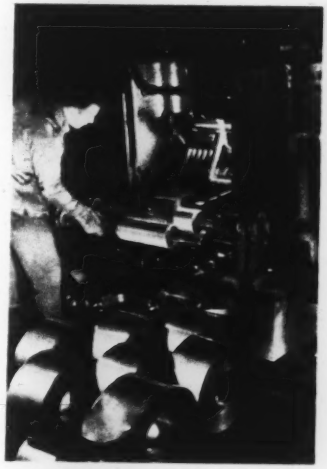
Credit for the reawakening can be shared between the normal business upturn and some muscular shoving by the government. Not only are loosened tethers of controls allowing civilian industry more freedom, but military orders are due to be coming out of the hopper soon and in great abundance. Coincidence or not, the humming of business by November will be impressive.

At Long Last Consumer goods producers, most of which came out of the summer and strike season on crutches, will welcome the Christmas push like a tax refund. Die casters, with the auto and appliance industries as their biggest customers, are beginning to stir. Battery makers are taking in lead for their seasonal run. Users of brass and copper for such items as jewelry, toys and gadgets undoubtedly will take advantage of their greater opportunity to use these metals.

Warehouses, particularly those stocking aluminum and magnesium, may get much more freedom in juggling the product mix of their stock to the changing needs of their customers. If NPA approves the distributors' plans, it should be a boon to fabricators who have to shop around for needed items and to the warehousers, who, under present regulations, can find themselves long on one item while not allowed to order another much in demand.

Price-Pass-Through Another stimulant to fall manufacturing comes from OPS action in pulling manufacturers out of the squeeze between higher materials costs and old price ceilings by allowing pass-through of increased costs of steel, copper and aluminum on fabricated products. While this policy has been seen necessary for some time, OPS couldn't find a simplified formula for effecting it. The increase takes the form of a dollar-and-cents markup for some manufacturers, a percentage raise for others.

Copper supply and demand, NPA proclaims, are in balance, actually there is more supply than demand in some quarters. Stocks have mounted considerably since Chile's price rebellion. Inventories held by foundries, brass mills and wire mills are highest in 18 months. Much buying was of a scare nature, a hedge against a domestic copper strike that now seems unlikely. Pressure for a domestic price hike is sure to come if other producers follow the 10-cent plus formula for labor peace initiated by Phelps-Dodge. Demand for foreign copper is steady, price remains at $36.50 delivered valley, but there's reason to believe it won't be that high at yearend.



COPPER ALLOY AT C. G. HUSSEY
...NPA claims supply-demand balance

Down the Ladder Both copper and aluminum dropped a rung in DPA's list of scarce materials. They moved from Group I to Group II. Of copper, DPA Administrator Henry H. Fowler thinks full allotments for most civilian needs are a possibility as early as the second quarter. He also believes all civilian aluminum demand can't be satisfied until 1954.

Aluminum producers will take issue with that. Salesmen are already putting on a lot of shoe mileage to line up business. True, say producers, the steel strike, storm damage and lack of water power in the Northwest took or will take their toll of production. True, the military and stockpile slices will be cut wider. But they figure the situation will return to normal within six months.

Around the Market Magnesium is now in easier supply, as witnessed by a drop in the government list. Lead and zinc can be found anywhere, but demand for both metals has firmed and there's little likelihood of further price concessions. In fact, much zinc is being sold only reluctantly at 14 cents. Cadmium markets are dull and foreign sellers readily offer discounts under U. S. prices. Mercury volume remains low, but the price has held tenaciously at close to $190.

Tin trading is being slowed by surprising price strength abroad. At present there's only a fraction of a cent between quotations from traders and the RFC price. The 94-6 alloy of tin and lead or copper is offered at $1.11-$1.12 a pound, but most users have heavy stocks to work off.

Alaskan Aluminum

Alcoa's ambitious Alaskan aluminum project, long in the discussion stage, is now in the negotiation stage, since the company weighed all factors and decided to go ahead at Tayia without a guaranteed market. Stumbling blocks include getting government approval and land rights, plus a complicated series of green lights for Canada and its province of British Columbia to use water from the Yukon river. When the plan first was proposed, as an alternative to a U. S. market guarantee to Alcan for Kitimat's expansion, the military took a dim view. The location was too close to Russia. Aside from military considerations, the location makes sense. Cheap and steady power obtainable more than makes up for carving a wilderness into a $400 million industrial colossus capable of 200,000 tons of aluminum yearly and with a potential capacity of double that.

Nonferrous Briefs

Alcoa is going after more auto trim business with an aluminum alloy that will take a brilliant finish. . . Tin concentrates for about four months' production have accumulated in Galveston, Tex., warehouse during the tin processing corporation's strike at Texas City. . . Brass and brass ingot business is off about 25 per cent, but some quarters see ingots, particularly the high alloys, in short supply within 30-45 days.

NONFERROUS METALS

Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50, Conn. Valley base 24.62½ delivered.

Brass Ingots: 85-5-5-5, No. 115, 27.25-28.50; 2, 215, 4-6-4-6, 30.50-31.50; 3, 305, 33.00; No. 1 yellow (No. 405), 21.25.

Zinc: Prime western 14.50; brass special 14.25; intermediate 14.00; East St. Louis high grade 15.15c delivered.

Lead: Common 15.80; chemical 15.90; corroding 15.90; St. Louis.

Primary Aluminum: 99% plus ingots 20.00c lb. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 10,000 lb orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy 17.00; 2 grade 16.00; steel deoxidizing grades 0.10% base guaranteed 98 to 99% grade 1, 18.50c; grade 2, 18.00; grade 3, 17.50; grade 4, 15.50.

Magnesium: Commercially pure remelt, granular ingots 10,000 lb and over 24.50c f.o.b. Freeport, Tex.

Tin: Grade A, prompt 1.21 lb.

Antimony: American 99.5% and over but not meeting specifications below 19.00c; 99.5% and over extreme low arsenic (max. 0.06%) offer imported 0.01% max. 19.00c f.o.b. Laredo, Tex. for bulk shipments.

Nickel: Electrolytic cathodes 99.9% base sizes at refinery unpacked 56.00c; 25 lb pigs 59.00c; NX nickel shot 60.00c; F nickel shot 57 ingots, additional for cast shot, 56.00c. Prices include import duty.

Mercury: Open market, spot New York $187-$190 per 76-lb flask.

Beryllium Copper: 3.75-4.25% Be $1.56 per lb of alloy f.o.b. Reading, Pa.

Cadmium: Regular straight or flat forms $2.00 per lb; special or patented shapes $2.15.

Cobalt: 97.99% $2.40 per lb for 500 lb. kegs; $2.42 per lb for 100 lb. drums; $2.47 per lb. under 100 lb.

Gold: U. S. Treasury $35 per ounce.

Silver: Open market, New York 81.25c per oz.

Platinum: $90-$94 per ounce from refineries.

Palladium: $23-$24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium: Sponge form, $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Mill prices, cents per pound, f.o.b. mill, effective July 1, 1952)

Sheet: Copper 45.52; yellow brass 40.17; commercial bronze 95% 43.10; 90% 44.38; red brass 85% 43.10; 80% 42.34; best quality 81.5% nickel silver 55.58; 65-18 nickel silver 55.08; phosphor bronze grade A 5% 64.72.

Rod: Copper, hot rolled 41.37; cold drawn 42.62; yellow brass free cutting 33.85; commercial bronze 90% 44.14; 85% 44.07; red brass 85% 42.26; 80% 42.60.

Seamless Tubing: Copper 45.50; yellow brass 43.15; commercial bronze 90% 47.04; red brass 85% 46.61.

Wire: Yellow brass 40.45; commercial bronze 95% 45.44; 90% 44.63; red brass 85% 43.30; 80% 42.60; best quality brass 41.04.

(Base prices effective July 1, 1952)

Copper Wire: Bare soft f.o.b. eastern mills 10,000 lb 32.75c; 1,000 to 10,000 lb 32.92c; less than 1,000 lb 33.42c. Weatherproof 10,000 lb 31.50c; 1,000 to 10,000 lb 31.58c; less than 1,000 lb 32.08c. Magnet wire del. 15 cities 10,000 lb 35.25c; less than 10,000 lb 35.50c.

ALUMINUM

(30,000 lb base, freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb. orders. Effective Aug. 4, 1952.)

Sheets and Circles: 2s and 3s mill finish, c.l.

Thickness Range	Width or Diameters Inches	Flat Sheet Base	Coiled Sheet Base	Circles Base
0.249-0.156	12-48	31.6		
0.155-0.095	12-48	32.1		
0.094-0.077	12-48	32.8	30.6	34.9
0.076-0.061	12-48	33.4	30.8	35.1
0.060-0.048	12-48	33.7	31.0	35.4
0.047-0.038	12-48	34.1	33.3	35.7
0.037-0.030	12-48	34.5	31.7	36.3
0.029-0.024	12-48	35.1	32.0	36.8
0.023-0.019	12-36	35.7	32.7	37.5
0.018-0.017	12-36	36.4	33.3	38.4
0.016-0.015	12-36	37.3	34.0	39.5
0.014	12-24	38.3	35.0	40.8
0.013-0.012	12-24	39.3	35.7	41.7
0.011	12-24	40.5	36.8	43.3
0.010-0.0095	12-24	41.4	37.9	44.8
0.0090-0.0085	12-24	42.6	39.1	46.6
0.0085-0.0075	12-24	44.0	40.3	48.4
0.007	12-24	45.5	41.7	50.6
0.006	12-18*	47.0	43.1	55.4

*Lengths 72 to 180 inches †Maximum diameter 26 inches

Screw Machine Stock: 5000 lb and over.

Dia. or Distance Across flats	Rounds H.T.-T4	Hexagons H.T.-T4	178-T4
0.125	54.6		
0.156-0.188	46.2		
0.219-0.313	43.6		
0.375	42.0	48.3	50.4
0.406	42.0		
0.438	42.0	48.3	50.4
0.469	42.0		
0.500	42.0	48.3	50.4
0.531	42.0		
0.563	42.0		47.3
0.594	42.0		
0.625	42.0	45.7	47.3
0.656	42.0		47.3
0.750-1.000	41.0	43.1	44.6
1.063	41.0		43.1
1.125-1.500	39.4	41.5	43.1
1.563	38.9		
1.625	38.3		41.5
1.688-2.000	38.3		

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets: Full rolls, 140 sq. ft. or more $21.00 per cwt; add 50c cwt 100 sq. ft. to 140 sq. ft. Pipe: Full coils $21.00 per cwt. Traps and bends: List prices plus 50%.

ZINC

Sheets 23.00c f.o.b. mill 36,000 lb and over. Ribbon zinc in coils 21.25c f.o.b. mill 36,000 lb and over. Plates, not over 12 in., 22.50c; over 12 in., 22.50-23.00c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold rolled 77.00c; strip, cold rolled 82.00c; Rods and shapes 74.00c; Plates, 75.00c; Seamless tubes 106.00c.

MONEL

(Base prices f.o.b. mill)

Sheets, cold rolled 60.50c; Strip, cold rolled 65.50c; Rods and shapes 58.50c; Plates, 59.50c; Seamless tubes 93.50c; Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb 56.00-62.00c; 25 to 99 lb, 49.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

Prices per lb 10,000 lb and over, f.o.b. mills) Sheets $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

DAILY PRICE RECORD

1952	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Aug. 12	24.50	15.80	14.50	121.50	20.00	39.00	56.50	83.25
Aug. 11	24.50	15.80	13.50-14.00	121.50	20.00	39.00	56.50	83.25
Aug. 6-9	24.50	15.80	13.50	121.50	20.00	39.00	56.50	83.25
Aug. 4-5	24.50	15.80	13.00	121.50	20.00	39.00	56.50	83.25
Aug. 1-3	24.50	15.80	13.00	121.50	19.00	39.00	56.50	83.25
July Avg.	24.50	15.80	13.00	121.50	19.00	39.00	56.50	82.850
June Avg.	24.50	15.06	12.74	121.50	19.00	39.00	56.50	82.75
May Avg.	24.50	15.519	12.50	121.50	19.00	42.077	56.50	85.356
Apr. Avg.	24.50	18.723	12.50	121.50	19.00	49.077	56.50	88.00
Mar. Avg.	24.50	18.80	12.50	121.50	19.00	50.00	56.50	88.00
Feb. Avg.	24.50	18.80	12.50	121.50	19.00	50.00	56.50	88.00
Jan. Avg.	24.50	18.80	12.50	109.404	19.00	50.00	56.50	88.00

NOTE: Copper Electrolytic del. Conn. Valley. Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis. Tin, Straits del. New York. Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound, except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb, f.o.b. shipping point, freight allowed. Flat, rolled 38.34c; oval, 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads 74.50c; 10,000 to 30,000 lb 75.50c; 3000 to 10,000 lb 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 300 lb through 10,000 lb; 34.00c over 10,000 lb. f.o.b. Cleveland, freight allowed on 300 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers, 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb 69c; 2000 to 9000 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 100 lb and over, $1.42; 500 to 999 lb $1.425; 200 to 499 lb, $1.43; less than 200 lb, $1.445. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.50c; 10 or more drums, 52.50c; f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl 98.5c; 100 lb kegs 99.5c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group 1: No. 1 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and bolings 16.25.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50. Mixed plant scrap: Copper-free solids, 10.00; dural type, 9.00. Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Lead: Heavy 12.50-12.75; battery plates 7.00-7.50; linotype and stereotype 13.50-14.00; electrotype 12.00-12.50; mixed babbitt 14.50-14.75.

Zinc: Old zinc 6.00-6.50; new die cast scrap 6.00-6.50; old die cast scrap, 4.75-5.00.

Wire . . .

Wire Prices, Page 133

New York—With few exceptions, finished wire products are moving to consumers in volume sufficient to indicate most mills' schedules will become current by November. There are openings for substantial number of wire products for fourth quarter, including oil tempered grades, although bookings coupled with backlog assure near capacity operations during the last three months. Demand for the automotive industry is increasing. Small volume of first-quarter tonnage has been taken, but there is no pressure to place forward commitments.

Plates . . .

Plate Prices, Page 131

Philadelphia—Sheared plate demand is as strong as ever, with the local situation becoming even more stringent because of suspension for two or three weeks, beginning Aug. 30, of the 120-inch and 160-inch plate mill at Claymont, Del. This suspension is due to a change-over program involving installation of edging rolls in the larger mill for production of slabs for the smaller. Work also includes some changes in soaking pit facilities. It is doubtful if plate production at Claymont will much exceed 25 per cent of capacity in September. Meanwhile, production in the open-hearth, flanging and pipe departments will continue active. Suspension of operations on some plate rolling facilities at Coatesville, Pa., will continue for at least another two weeks while alterations and repairs are being completed on the 112-inch and 120-inch mills. Effort was made at both Claymont and Coatesville to get these programs under way during the steel strike, but the unions refused to let the work go ahead. Plate producers are still awaiting word from OPS on mark-ups permissible on heads and flange work. Ten thousand tons of plates will be required for unassembled tanks for the Philadelphia Army Engineer Corps; bids closing Sept. 9. Tanks are for export for welding at point of erection. Also 5800 tons of plates will be required for a tanker just placed by Atlantic Refining Co. with the Sun Shipbuilding & Dry Dock Co., Chester, Pa. Hull steel for this tanker also will include 2900 tons of shapes and bars.

Boston—Shops fabricating heavy plates, notably for weldments, are getting more tonnage under Z-2 ratings. In fact, bulk of deliveries are covered by that or other high symbols. Steel is being cut up about as fast as received and heavy plate shops are not adding much to inventory; none have reached capacity operations. There also are some gaps in strip mill sizes, although shops using lighter plates generally have better inventories. Strikes are cutting down consumption at two shipyards. From Sparrows Point base, carbon plates are now 4.613c, Boston, 20-ton minimum, and 4.475c, 40-ton minimum.

New York—Contrary to the situation in most steel products, plates, and particularly the heavy gages, are in strong demand. District plate fabricators, including shipyards, find inventories highly unbalanced and, as a result, are having difficulty sustaining operations. This stringency may be pronounced for another several weeks, as virtually all producers are booked up solidly throughout the rest of the year, especially with due allowances for military set-asides. Most mills find the arrearages so heavy, particularly because of the strike, that they will be unable to accept any new nondefense orders before next year. Due to the recent increase of $4 a ton, retroactive to July 26, the governing base on shipments here is 3.90 cents, or 4.383 cents, delivered New York.

Pittsburgh—Availability of steel plate is still hampered by carryovers expected to absorb any fourth-quarter tonnage that might be available if production gets to the pre-strike rate. Inroads into carryovers are still sluggish due to the low rate of production. Present output rate is about 97 per cent, compared with 105 to 107 per cent before the strike.

Chicago—Some of the tightness in plates recently has been due to demand for cartridge cases. There is some reason to believe a slowdown in the program has been ordered. Platemakers who had been canvassed for maximum tonnage they could furnish to the program are finding that somewhat less is going to be needed.

Los Angeles—With petroleum refinery activity at boom levels, fabricators' plate requirements are mounting. Supply outlook for nonrated needs is bleak. Carryover on platemakers' order books extends into first quarter.

Seattle—Small plate shops are suffering from scarcity of steel and are improvising where possible. Largest tonnage pending is for the Lucky Peak penstock, bids Sept. 23. Port of Edmonds, Wash., will open bids Sept. 10 for a ferry terminal involving 150 tons of steel piling.

Steel Bars . . .

Bar Prices, Page 131

New York—Nondefense consumers can still get a little new tonnage in hot alloy bars for fourth-quarter delivery, but no hot carbon bars, it appears. There is a spurt in high-rated defense work, which is being accommodated by the set-asides producers provided in compliance with government regulation. Except for cold-drawn bars, sellers have not opened books for shipment of tonnage beyond the end of this year, apart from high-rated military needs. With prices up $5 a ton, retroactive to July 26, hot carbon bars at Johnstown, Pa., the governing base for this district, are 3.95 cents, or 4.571 cents delivered New York.

Philadelphia—While not getting off to as fast a start as anticipated following settlement of the steel strike, defense demands for hot and cold carbon bars are accelerating. Pressure for hot bars, over 2½ inches, for shell work is so great that nondefense consumers are virtually squeezed out for the time being on these larger sizes. Actually there is not much new bar tonnage in any size available for them before early next year. They will have to be largely content with what comes through on arrearages and that will not net as much tonnage as set up for certain of the earlier quarters of the year.

Boston—Bar tonnage shipped to consumers in fourth quarter will be mostly against old orders. Mills are able to book relatively no new orders for civilian requirements during the last three months and some third-quarter volume may be reduced by directives and set-asides, the former increasing. Additional hot-rolled tonnage is reaching cold finishing mills and operations at the latter have been stepped up. Their backlog also includes a substantial ratio of high-rated orders.

Los Angeles—Tightest of all steel products is flat bars, supplies of which are virtually depleted. Pressure from aircraft industry fabricators for cold-finished alloy bars is mounting.

Sheets, Strip . . .

Sheet and Strip Prices, Page 131 & 132

Boston—Cold strip steel converters are increasing production as hot-rolled deliveries against allotments are heavier. But most are operating on hand-to-mouth basis and are making slight progress toward building to 30-day inventory. Cold strip producers are filled for fourth quarter, but extent of carryover depends on improved balance in hot-rolled deliveries. Practically no tonnage has been taken for first quarter. Most metalworking shops fabricating sheets have stepped up operations, but few have reached capacity. Stampers with parts contracts for the automotive industry are under pressure for deliveries.

New York—Little real pressure prevails for sheets. Nondefense consumers would probably place new orders if they knew there was a chance to get tonnage before the end of the year. They appear to be content to go along on what they are receiving against arrearages. They are showing no great interest in gray market tonnage or even conversion tonnage, which of course, would have to be taken in at a premium. Practically the only light flat-rolled item, barring one or two specialties, such as straight chromium material, that can still be had against new orders for fourth quarter is cold-rolled strip. Reflecting the recent increases in steel prices, the governing base on hot sheets for shipment here is 3.775 cents, Sparrows Point, or 4.2580 cents, delivered New York, and on cold sheets, 4.575 cents, Sparrows Point, or 5.058 cents, delivered New York.

Philadelphia—Although some improvement is noted in production of washing machines, radios and TV sets and there is more activity here in the fabrication of autobody parts, demand for consumer durable goods generally still lags. Stovemakers note little or no improvement and manufacturers of deep freezers and refrigerators, especially of the commercial type, report light backlogs. Thus consumer pipelines still appear fairly well filled. No strong pressure, consequently, is developing for sheets and strip, although most consumers are willing to take what they can get and the mills are well booked for

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the rest of this year. Only in hot and cold strip, of the major grades, does supply appear easy, and even in these items consumers may have to shop a bit to place new orders for shipment this year, short of turning to the warehouses.

Pittsburgh—Steel sheet and strip supply remains tight, with little indication of its easing before well into next year. Converters and the military are getting 63 per cent of one company's output. Hot-rolled sheets are in shortest supply. Some cold-rolled may be available for January delivery. Galvanized and silicon are easing. Demand for conversion sheet increases, and is expected to be strong until November.

Los Angeles—Fabricators are girding themselves for an increasingly desperate strike-caused steel shortage situation expected to reach peak intensity by the fourth quarter. Some manufacturers of low-priority items say they have the lowest inventory of finished steel since 1948.

Structural Shapes . . .

Structural Shape Prices, Page 131

Boston—Fabricated structural steel in process began to pile up in shops following strike of approximately 1800 AFL iron workers; steel erecting on scores of projects in New England, Connecticut excepted, stopped and crane booms dismantled in some cases. Concrete bar reinforcing operations are also hampered. Prices for bridge and other fabricated structural steel continue to inch upward. Low bids on 5010 tons, bridge superstructure, Agawam-Springfield, was 25.92c a pound in place quoted by American Bridge Co.; one week previously a similar bridge superstructure over the Merrimack River, Amesbury-Newburyport, Mass., 4250 tons, brought out a low bid of 25.19c, Harris Structural Steel Co.

New York—Bridge work still predominates, there being little defense or commercial work. The latter is handicapped by lack of government approval because of the current shortage of steel and also uncertainty as to future costs. This uncertainty is holding up some public projects too. Proposed work on the Second avenue subway has been deferred because of increasing costs and question as to what the trend might be some months from now. Eventually this project will go ahead, but just when cannot now be indicated. This project would require about 250,000 tons of steel.

The Port of New York Authority opened bids on about 3500 tons of miscellaneous steel, including structurals, reinforcing bars and piling, for the Manhattan approach to the new lane to be built in the Lincoln Tunnel. Opening of bids on about 65,000 tons of cast segments for this project is postponed until Sept. 15.

Reflecting the $4-a-ton increase in shapes, retroactive to July 26, the governing base price on shipments here is 3.90 cents, Bethlehem, Pa., or 4.235 cents, delivered.

Philadelphia—While spotty and still dominated by bridge work, the local structural market reflects some pick-up in industrial demand. Plant projects are relatively small, but a bit more numerous. Apartment and light commercial work is limited, due mainly to governmental restrictions.

Fabricating shop inventories are improved although they are still far from being in balance.

Pittsburgh—Supply of structural shapes in this area remains tight. Fabricators are presently operating, but not at top production. They have been getting some material, not all they would like, due to heavy backlogs, but far more than they expected when the strike was first settled.

Seattle—Fabricators have good backlogs of orders but steel supplies continue short. Shipments from the East are slow. Coast mills are furnishing to the best of their capacity. Largest tonnage up for figures at the moment is 1000 tons for completion of outlet works, Lucky Peak dam, bids to U. S. Engineer, Walla Walla, Wash., Sept. 23.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 131

Boston—Cost of concrete reinforcing steel bars in place for bridges and buildings is higher, contractors quoting 14.00c per pound and more, passing on high material and labor charges. Because of strike by outside iron workers, numerous reinforced concrete construction projects are down, notably housing construction in various stages of completion. Demand for reinforcing steel is strong, although considerable tonnage placed will not be needed for some months in case of bridges, including the Fitzgerald expressway, Boston.

Seattle—All rolling mills in this area are running at 100 per cent of capacity. Immediate problem is to expedite deliveries delayed by the strike. Inquiry is strong, especially for small tonnages. State projects and public works jobs up for early action involve large quantities of reinforcing bars.

Pig Iron . . .

Pig Iron Prices, Page 130

Chicago—Demand for pig iron exceeds supply, a situation which is likely to continue for some time. With International Harvester foundries closed by strike, Wisconsin Steel is channeling more iron to the merchant trade. In addition Inland Steel has made 10,000 tons of basic available, a portion of which will go to foundries. Most of this is committed with shipments to be completed by Sept. 30.

New York—Blast furnace production in June fell to 1,068,281 net tons because of the steelworkers' strike. Output was at only 17.6 per cent of capacity. The June production figure consisted of 1,056,278 tons of pig iron and 12,003 tons of ferromanganese and spiegel, the American Iron & Steel Institute reports. Blast furnace output in the first half year totaled 29,909,042 tons, comprising 29,621,004 tons of pig iron and 288,038 tons of spiegel. Blast furnace operations averaged 81.5 per cent of capacity in the first half.

New York—Pig iron demand and supply are in fair balance. Good grades of Continental iron, both foundry and basic, are offered at the lowest levels in several months—at around $65 c.i.f. eastern port—but are attracting little consumer interest. Demand for coke has picked

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up some, but supply still exceeds demand. Contributing to the stronger tone is threat of a coal strike this fall, a factor that also is resulting in a little betterment in pig iron business.

Philadelphia—Domestic pig iron sellers and consumers are keeping their ears to the ground for a possible price advance. While some have doubted that there would be any change until after coal negotiations have been settled, others now believe that an increase of $2 or $2.50 might come at any time. Basic is scarce, with foundry grades in fair supply. Coke demand continues to improve, reflecting in part threat of a coal strike this fall. Actual consumption of coke has not been stepped up much, buying being more for the building up of inventories.

Pittsburgh—Foundry operations continue slow, although pig iron demand is brisk because of inventories that sagged during the steel strike. Upswing in pig iron orders is attributed to inventory buildups, rather than increased foundry business. Activity in miscellaneous jobbing castings is especially sluggish.

St. Louis—Fourthquarter pig iron allotments to consumers in this district will be unchanged from the third. Melters are in tight but operable position. A flurry of inquiries from South American defense ministries has been rejected. Nearly all inquiries from outside the St. Louis area, on the increase since the strike, have met little success. Granite City Steel's two stacks have long been on basic, but one is shifting to malleable Sept. 1. Ore stocks are comfortable and officials feel they could ride out a coal strike for a month or two. Seventy per cent of their coal comes from southern Illinois mines which are outside the John L. Lewis jurisdiction.

Birmingham—Pig iron users are catching up fairly well on their requirements but the supply situation is described as still tight. A noticeable easing off is anticipated by the end of the current quarter with the likelihood of some additional free iron early in the new year.

Los Angeles—Most foundries are busier at about 75 per cent of capacity. Demand for pig iron is rising. Kaiser Steel Corp. and Columbia-Geneva Steel Division of U. S. Steel Co. are making pig iron available to the trade.

Conversion Steel . . .

Chicago—One of the peculiarities of steel conversion now as compared with former periods when this business flourished is the wider spread in ingot prices. Since the steel strike rejuvenated conversion activity it is observed that the spread is about $40. Ingot prices currently range from $70 to $110. It is expected conversion interest will be intense through October, taper off in November and perhaps become negligible in December. Rapid recovery of steelmaking since the strike ended appears responsible.

Scrap . . .

Scrap Prices, Page 138

Pittsburgh—Scrap market is softening, and if it continues at the present rate, it may bring prices below ceiling. Buyers aren't buying anything. Inventories of scrap were good at the end of the strike and haven't been depleted yet. Big reason has been that orders and deliveries since the strike have been predicated on 100 per cent or better operation, and actual operation has fallen short, resulting in a further build-up of scrap inventories.

Detroit—Traders discount the effect of conversion deals on making the Detroit scrap market possibly more hectic than that of any other region. Dealers' scrap was in strong demand when industrial scrap generation was down. A somewhat less urgency now exists for this material, although stove plate, traditionally a dealer item, is in good demand from specialized foundries in this area and Toledo. Blast furnace scrap consumption is high, and mills generally are finding it difficult to hold their own and not deplete scrap inventories.

Boston—Of steel scrap grades only turnings have weak tone, although in one case this grade also moved at ceiling price. Cast grades gradually are firming in price. Dealers are paying higher prices for unprepared steel scrap at yards, also for mixed cast.

New York—Although there are some hold-ups, steel scrap is moving well. Cast grades are somewhat more active, with a further betterment anticipated this month as prospects in the foundry field are more promising. Brokers' buying prices on No. 1 cupola are $44.00-$45.00 and on unstripped motor blocks $37.00-$38.00.

New York Central Railroad over the next few months will scrap 300 steam locomotives. The railroad estimates that the scrap reclaimed from them will provide 50,000 tons of finished steel. The locomotives are stored at various points, with the largest concentrations near Buffalo and Cleveland. From these points they will be moved to the Lackawanna plant of Bethlehem Steel Co.

Buffalo—Ceiling price levels and bullish sentiment dominated the scrap market. Quick clearance of stock accumulated during the steel strike and placement of new orders by top mills at ceiling prices in steelmaking grades buoyed sentiment. Small sales of cast scrap at slightly below control levels vied with sales at ceiling levels and dealers' enthusiasm remained on the bullish side. Boat receipts for a week approximate 15,000 tons.

Philadelphia—Except for top quality material, steel scrap is under relatively little pressure. Shipments of some secondary grades are being held up in at least two instances and in another all truck shipments are temporarily suspended. Low phos scrap is moderately active. Business in cast continues rather sluggish, although prices on most grades, and this includes steel scrap as well, continue at ceiling. Exceptions are unstripped motor blocks $41, delivered, and No. 1 cupola cast which is holding at $46.00-$48.00, delivered.

Chicago—Cast grades are center

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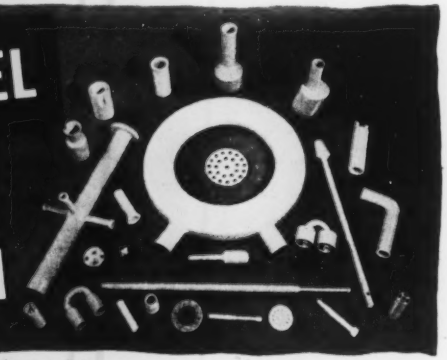

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of interest in the scrap market. Stronger demand which has moved prices up further reflects pig iron shortage and better foundry operations. Drop broken machinery is at ceiling in some acquisitions and several other items have moved to near ceiling. Some consumers are beginning to resist the upward surge, and what happens to price level from here on depends on further gains in orders for castings. There still is softness in these orders. Steelmaking scrap is at full ceiling and inventories are very high. New buying is light except for top grades and is confined to material of industrial origin. Mill intake is chiefly completion of old orders. Blast furnace grades are in soft demand.

St. Louis — Country shipments of scrap are slowing markedly. Truckers and farmers are not moving it to concentration points, and dealers here are wondering whether it means they are too busy or the rural scrap source is exhausted. Mill buying is picking up moderately. Virtually all steel grades are at ceiling, with some going above ceiling through reduced springboards. One 10,000-ton lot of No. 2 steel went last week at ceiling with $2 springboard. Cast market is somewhat firmer, as numerous smaller foundries, with orders picking up a trifle, find their inventories too low. Foundry improvement is quite spotty. Some small ones, formerly sharply curtailed, are upping operations to a 4 or 5-day week.

Birmingham — Scrap movement is moderate with reasonable demand for cast and some specialties in melting steel. Broker and dealer sources report prices unchanged this week.

San Francisco — No. 1 cupola cast iron remains firm at $46 a ton delivered despite some loss of buying by the close-down of U. S. Pipe & Foundry Co.'s plant at nearby Decoto. The plant, closed since Aug. 6 because of a labor dispute, manufactures cast iron pressure pipe. Prices of steel grades of scrap remain unchanged at ceilings, except No. 2 bundles and turnings which are $5 a ton below the permissible tops.

Seattle — Steel scrap is arriving at tidewater in ample volume and supplies are easy. Bundles are probably in best supply. Buyers state that farm and auto scrap is generally of poor quality. Ceiling prices prevail generally although $1 to $2 under is quoted for mixed truck loads. The navy yard is now selling on bids in the open market, 1200 tons of prepared scrap being bought by a Bellingham dealer at $32.88. For 600 tons of unprepared material $24.88 was bid. Navy yard scrap is of high grade. Some buyers hope government restrictions will soon be rescinded, arguing that under an open market they can buy what they want instead of having to take mixed lots, often of doubtful quality.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 135

Chicago — Foundry coke continues to move up in demand. Foundries need more to match rising melting rates, and fear of a coal strike prompts building up heretofore light inventories to a safe level.

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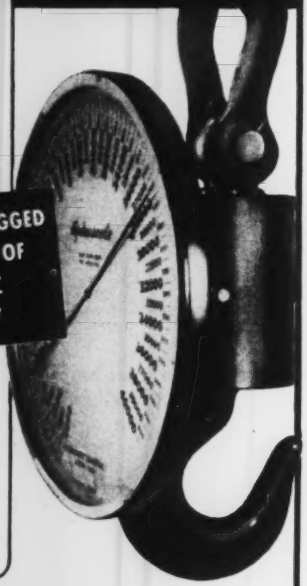

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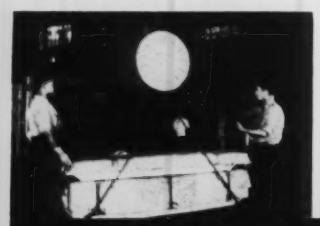

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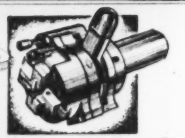

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Iron Ore . . .

Iron Ore Prices, Page 137

Cleveland—Stocks of Lake Superior iron ore at furnaces and on Lake Erie docks on June 1 were 31 per cent greater than on the corresponding date a year ago. On June 1, 1952, stocks totaled 25,904,369 gross tons, compared with 19,771,719 tons on June 1, 1951, the Lake Superior Iron Ore Association reports. On May 1, 1952, stocks were 19,591,854 tons. Consumption of Lake Superior ore in May, 1952, totaled 6,932,047 gross tons, compared with 6,616,196 tons in April, 1952, and 7,761,173 tons in May, 1951. Cumulative consumption through May of this year totaled 36,326,915 tons, compared with 36,326,915 tons, compared with 36,129,129,853 tons in the corresponding period of 1951.

New York—First shipment of iron ore for United States Steel Co.'s Fairless Works, Morrisville, Pa., arrived at Girard Point, Philadelphia, for transfer by rail to its ultimate destination. The shipment—2500 tons from Cuba—is the first of 25,000 tons of this ore sold to U. S. Steel by Cia. Woodward y Dickerson, Habana office of a Philadelphia trading company. A similar sized tonnage is expected to come in to Philadelphia early in September and still another the latter part of that month. The sellers hope to complete shipments against the 25,000-ton contract by the end of the year.

Chicago—Inland Steel Co.'s flagship, the *Wilfred Sykes*, set an all-time record for bulk tonnage on the Great Lakes last week. It cleared Superior, Wis., with 21,013 gross tons of iron ore for delivery to Indiana Harbor, Ind. The cargo is the first on the Great Lakes to exceed 21,000 gross tons and approaches the rated capacity for which the vessel was designed. Other vessels also are establishing cargo records.

Seattle—Movement of eight or ten full cargoes of iron ore from Campbell river, British Columbia, to the North Atlantic, presumably for discharge at Sparrows Point, Md., is of current interest. The shipments have not been completed. They are believed to mark the first time ore has been forwarded from this area to Eastern mills. The Campbell river field recently was opened and shipping piers were completed a short time ago. Some ore has been shipped from this mine to Japan. While some sources attribute the current movement to the East Coast to the steel strike, the more probable cause is believed to be the distressed condition of shipping. Many freighters returning from offshore have found cargoes lacking and rates extremely low. As an illustration ore rates from this area to Japan were quoted at $14 a year ago. Today similar business can be done at $5 to $6. Consequently it is assumed that these vessels in distress accepted exceptionally low rates on ore to the Atlantic in order to return to that area where it is hoped better rates will be found. Firms handling this business are extremely reticent regarding details but it is intimated that the movement is only temporary, for under normal conditions, British Columbia ore is competitively out of the question for East Coast delivery. Its ore content is reported to be 55 to 58 per cent.

Warehouse . . .

Warehouse Prices, Page 137

Philadelphia—Jobbers' business here still is being restricted by their unbalanced inventories. This is especially true in plates, shapes and bars, but not to any great extent in sheets and not at all in hot and cold strip. Distributors report the month just ended as being off both in point of tonnage and dollar volume. Despite post-strike operations at the steel mills, warehouse inventories could not be built up to even the average level of July, and this hurt. Price-wise, the recent increases came too late to offset the decline in business volume. Only where distributors dealt substantially in tool steels and stainless, which items carried a "mill parity" and the increases therefore were in effect throughout the month, was there an approach in dollar volume to that of the preceding month.

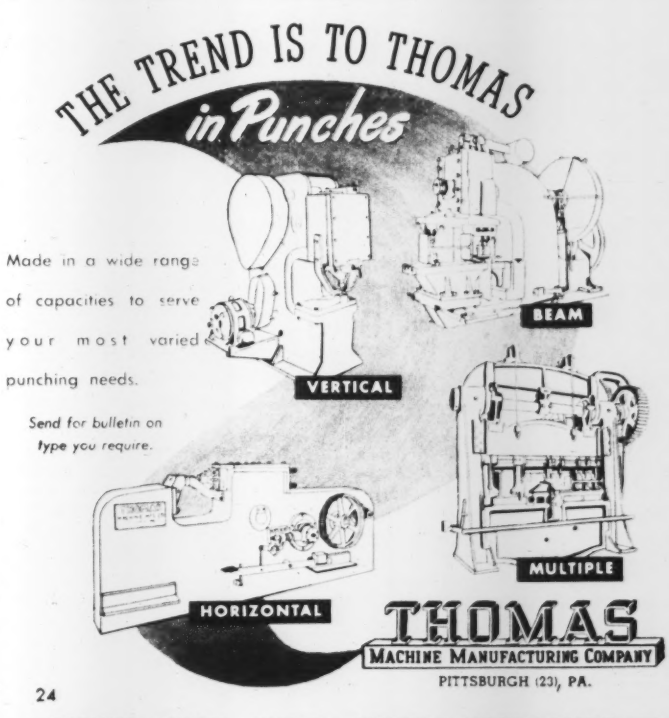
Boston—Distributors revised prices upward, structural shapes now being 6.75 cents and carbon plates 7.00 cents. Demand for steel from warehouses is steady and deliveries from mills are heavier on most products, although not in volume to permit building of inventories, notably in heavy plates and bars.

New York—Except for nails and wire products, demand for steel from warehouses holds at high level. Sheets, pipe, bars and plates move out as soon as delivered and stocks are still short. Prices have been increased in line with mill advances, although some distributors of nails have not raised prices.

Pittsburgh—Warehouses in this area are getting a reasonably good supply of steel, representative of most types. While it is not all they would like, it is enough to sustain a trickle of material to customers. Delays in delivery to warehouses are shorter, but it will be some time before warehouses have a complete stock of steel for quick delivery. Hardship cases are being taken care of immediately by shuffling orders from customers in less dire need of steel.

Chicago—Warehouses report strong push from consumers and for mill-size tonnages. These cannot be accommodated and outlook is that many manufacturing plants will not be able to maintain production schedules. Warehouse intake from mills is improving but tonnage lumps bigger than sizes. Plates are coming in a little better. Hot-rolled and cold-drawn bars are in slow receipt and sizes are limited.

San Francisco—Jobbers' prices have moved up coincidentally with the advances granted the steel mills. Schedules now are being worked out and many jobbers complain it is a complicated job. Office staffs are kept busy adjusting previous invoices to compensate for the retroactivity in



the permitted price advances. Ordering continues firm. Stocks are getting into better balance with resumption of mill production.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4700 tons, superstructure, multi-span, tee truss bridge, Merrimac river, Amesbury-Newburyport, Mass., to Harris Structural Steel Co., New York; $2,570,000; bids Aug. 12.

1500 tons, rejected May 17, 1952, awarded Lister Steel Co., Los Angeles, for Boeing Airplane Co., Seattle, materials and maintenance buildings; Sound Construction & Engineering Co., Seattle, low, $1,600,124 for general erection; structural award was $901,671.

600 tons, Army research building, Fort Monmouth, N. J., to Lehigh Structural Steel Co., Allentown, Pa.

1200 tons, plant, Union Carbide & Carbon Co., Calvert, Ky., to Ingalls Iron Works, Birmingham.

875 tons, state bridge, Northampton county, Pennsylvania, to Lehigh Structural Steel Co., Allentown, Pa.

60 tons, plant addition, Heintz Mfg. Co., Philadelphia, to Bethlehem Fabricators Inc., Bethlehem, Pa.

120 tons, state bridge, Nassau county, New York, through Norri Construction Co., to Bethlehem Steel Co.

120 tons, three state bridges, Tolland-Willington, Conn., to American Bridge Co., Pittsburgh; Brunalli Construction Co., Southington, Conn., general contractor.

270 tons, Du Pont plant addition, Richmond, Va., to Bethlehem Fabricators Inc., Bethlehem, Pa.

200 tons, state bridge, Grier, Idaho, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

STRUCTURAL STEEL PENDING

2300 tons, building, 1252 tons, miscellaneous mill forms and products, pulp mill project, Ward Cove, for Ketchikan Pulp Co.

1300 tons, Manhattan approach, Lincoln Tunnel addition, Port of New York Authority, New York; bids closed Aug. 26. Tonnage involves miscellaneous structural work, piling, shoring, reinforcing bars, etc.; opening of bids on the east segments, now estimated at about 65,000 tons, were postponed until Sept. 15.

1000 tons, completion outlet works Lucky Peak dam project, bids to U. S. Engineer, Walla Walla, Wash., Sept. 23.

945 tons, state bridge work, contract 2, Union county, New Jersey, J. F. Chapman & Son, Hillside, N. J., low on general contract.

870 tons, state bridge work, Northampton county, Pennsylvania; bids Sept. 19.

715 tons, steel sheet piling; bids Sept. 10, Corps of Engineers, Milwaukee.

520 tons, state bridge work, contract 1, Union county, New Jersey, George M. Brewster, Bogota, N. J., low on general contract.

300 tons, hangar, United Aircraft Corp., East Hartford, Conn.; bids in.

125 tons, ferry terminal, Edmonds, Wash.; bids to Port of Edmonds, Sept. 10.

110 tons, shapes and bars, bridge, North Adams, Mass.; bids in.

100 tons, bridge superstructure, North Adams, Mass.; bids in Department of Public Works, Boston.

Unstated, missile assembling shop, Huntsville, Ala.; bids to be opened by Army Corps of Engineers, Mobile, Ala., Sept. 11.

REINFORCING BARS . . .

REINFORCING BARS PENDING

1577 tons, Ketchikan Pulp Co.'s Ward Cove, Alaska, pulp mill.

1200 tons, Tacoma city light administration building; bids Sept. 15.

430 tons, state bridge work, Northampton county, Pennsylvania; bids Sept. 19; also 870 tons of structurals.

250 tons, state bridge work, Allegheny county, Pennsylvania; bids Sept. 19.

100 tons, Washington state King county bridges, general contract to Port Construction Co., Port Angeles, low, $137,504.

PLATES . . .

PLATES PENDING

500 tons, Ketchikan Pulp Co., Ward Cove, Alaska, pulp mill.

500 tons, penstocks etc., outlet works Lucky Peak dam; bids to U. S. Engineer, Walla Walla, Wash., Sept. 23.

305 tons, chiefly one-inch, structural steel plates; bids in to Corps of Engineers, St. Louis; also 370 tons, carbon steel bars, rounds, chiefly five-inch.

150 tons, sheet steel piling, ferry terminal; bids to Port of Edmonds, Wash., Sept. 10.

PIPE . . .

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175 tons, 12 to 6-inch distribution mains, to Pacific States Cast Iron Pipe Co., Provo, Utah, by Port Angeles, Wash.

CAST IRON PIPE PENDING

2000 tons, feeder and connecting system for Atomic Energy Commission, 30 and 20 inch pipe, Richland, Wash.; Cisco Construction Co., Portland, Oreg., low general contract, $687,000; alternatives for pipe permitted.

RAILS, CARS . . .

RAILROAD CARS PLACED

Alaska Railroad, 200 seventy-ton hopper cars; rebuilt, ready for service, Chicago, Ill., to Chicago Freight Car & Parts Co., Chicago, $3,845 per unit.

Boston & Maine, 3 rail diesel cars, to Budd Co., Philadelphia.

Illinois Central, eight 30-yard drop-door air dump cars, to Baldwin-Lima-Hamilton Corp., Eddystone, Pa.; also six sleeping cars, to Pullman-Standard Car Mfg. Co., Chicago.

New York, New Haven & Hartford, 100 electric multiple unit cars for commuter service; 100 insulated freight cars, placed.

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Here and There in Metalworking . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Navy Plans Large Pickling Plant

Navy Department will establish a large metal pickling plant at Port Hueneme, Calif. Plans are being formulated in the Public Works Department for installation and construction of this pickling unit which will be used to remove rust and corrosion and apply a preservative coating to equipment and component parts of steel and metal gear slated for overseas shipment.

SKF Tools Up Altoona Plant

SKF Industries Inc. is tooling up for production at its new plant in Altoona, Pa. The first bearings to be produced at the Altoona plant will be the size used in automobiles.

Builds Foundry in Bay City, Mich.

Luria Engineering Co., New York, erected a 7700 square foot foundry in Bay City, Mich., for H. Hirschfield Sons Co.

Caterpillar Tractor Co. Expands

Caterpillar Tractor Co., Peoria, Ill., is constructing two steel buildings which will add 32,000 square feet to its plant facilities in that city. One will be used for jigs and fixtures while the other will be used for reclamation purposes.

Frankford Arsenal Awards Contract

Frankford Arsenal, Philadelphia, awarded one of the largest single contracts yet placed for environmental test equipment to Tenney Engineering Inc., Newark, N. J. Totaling nearly one-half million dollars, the contract calls for a cold room, an anteroom for the cold room, a humidity chamber and an arid desert room.

Gerhardt Building Larger Factory

George T. Gerhardt Co. Inc., metal fabricating firm, sold its San Francisco building and will move to a larger factory to be constructed at Marinship, Sausalito, Calif.

Shakeproof Opens Stamping Plant

Shakeproof Inc., a division of Illinois Tool Works, Chicago, opened a plant in Des Plaines, Ill., to produce metal fastening devices and special precision stampings. Manufacturing space made available in the Chicago plant by concentrating Shakeproof stamping operations in Des Plaines will be devoted to production of gear measuring machines, metal cutting tools and machine tools. In addition to a large press room, the plant will house a complete die making and die maintenance shop. Standard products will include lock washers, spring washers and locking terminals.

Steel Parts Corp. Organized

Kingston Products Corp., Kokomo, Ind., transferred its Tipton Division to Steel Parts Corp., a new corporation created for that purpose.

A. O. Smith Appoints Distributor

A. O. Smith Corp., Milwaukee, appointed Domic Engineering Sales Inc., Indianapolis, as its agent for distribution of safety grating in Indiana.

Carbomatic Moves Plant and Offices

Carbomatic Corp. moved its manufacturing plant and offices to larger quarters at 70 Bennington Ave., Freeport, N. Y.

Arc Welding Group Offers Prizes

A new competition for designers, engineers and manufacturers of machinery of all types is announced by James F. Lincoln Arc Welding Foundation, Cleveland. The program offers $30,000 in 101 cash awards for

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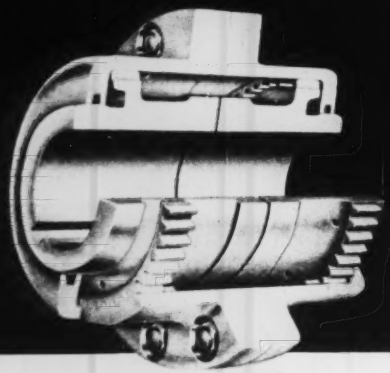

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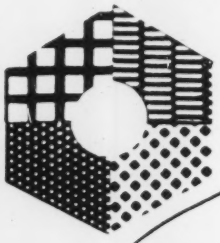

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the best papers describing the mechanical design and construction of any type of machine or machine component which is designed for arc welded steel fabrication. The program closes July 27, 1953. Rules and conditions brochure is available from the organization offices at 22801 St. Clair Ave.

Engineering Firm Changes Name

R & S Engineering Co., Milwaukee, changed its name to The Rose Co. E. E. Rose is president.

Steel & Tubes Marks 50th Year

Steel & Tubes Division, Republic Steel Corp., Cleveland, celebrated its 50th anniversary last month. This fabricator of electric-weld tubular products was founded at Elyria, O., as the Elyria Iron & Steel Co., in August, 1902. Its four plants now produce more than 375 million feet of mechanical tubing, boiler and pressure tubes, and stainless tube and pipe.

National Supply Opens Montana Store

National Supply Co., Pittsburgh, opened a supply store at Glendive, Mont. C. E. Sease Jr., formerly of Casper, Wyo., is manager of the store, temporarily located at 906 N. Merrill Ave.

Lincoln Park Industries Expands

Lincoln Park Industries Inc., Detroit, purchased a 51 per cent interest in Standard Engineering Co., that city. Standard Engineering's activities include complete operations, processing and layout, and designing of all machines, tools, inspection gages and equipment necessary to produce completed parts and assemblies for the mechanical industries.

Union Metal May Build in Canada

Union Metal Mfg. Co., Canton, O., is reported to have taken an option on a 16-acre site in Brampton, Ont., and plans the erection of a plant with initial floor space of 15,000 square feet. The company manufactures a large line of metal products, including lighting and sign standards and pilings.

Teleflex Moves Plant

Teleflex Inc. moved its plant to 337 W. Walnut St., North Wales, Pa. Its main office is 125 S. Main St. while its mailing address is P.O. Box 69, North Wales.

Perfection Stove Names Distributor

Perfection Stove Co., Cleveland, appointed Farrar-Brown Co., Portland, Me., as its distributor in that territory.

Toerge Leaves STEEL

Walter F. Toerge, for a year and a half the engineering editor of STEEL, resigned that position to join the Public Relations Department of Ketchum, MacLeod & Grove Inc., Pittsburgh industrial advertising agency. Mr. Toerge joined STEEL on May 1, 1946, and was with the production and engineering editorial staff throughout that time. His new duties became effective Sept. 1.

Manganese Chemicals To Build Plant

Manganese Chemicals Corp., Minneapolis, will construct a plant near Riverton, Minn., for recovery of manganese in quantity from vast deposits of low-grade ores in the Cuyuna Range. The plant will have a capacity to treat at least 200 long tons of manganiferous ores per day. A chemical leaching process will be used in the plant. Cost of the facility will be about $2 million, of which the government will advance up to $1.5 million. For the first six months of operation, after the starting up period, the base price guaranteed by the government will be $2.35 per unit. The

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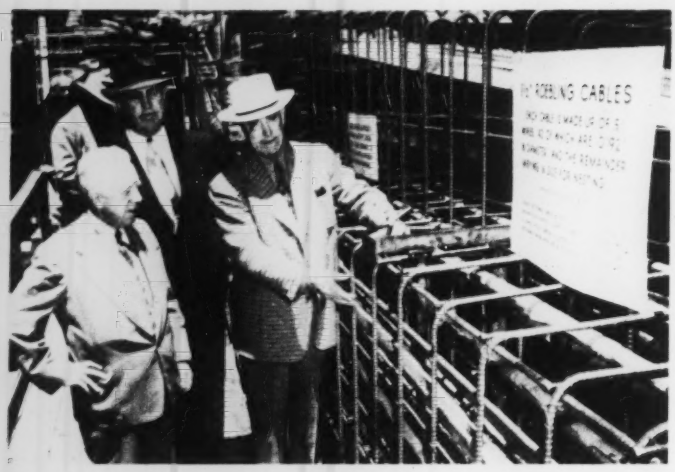

Canes of Steel Hold Up Garage

When Barrett Garages Inc., San Francisco, started construction of its new downtown garage, so much interest was shown in the prestressed concrete girders being used that the contractor, Barrett & Hilp, and consulting engineers, Ellison & King, held open house for other contractors and technicians. Steel cables are stressed by huge jacks and the concrete poured in the forms around them. Result: A stronger girder with considerable economies of labor and materials

base price guaranteed by the government in the manganese purchase program, which went into effect July 7, 1952, is $2.30 per long ton unit for 48 per cent manganese ores and concentrates.

Arbutus Steel Erecting Plant

Arbutus Steel Co. Inc., Arbutus, Md., general metal fabrication, and maker of bar and large span joists, is erecting a 6500-square-foot plant at 3900 Coolidge Ave. Samuel Pistorio is president.

Borg-Warner Buys Atkins & Co.

Borg-Warner Corp., Chicago, purchased E. C. Atkins & Co., Indianapolis, a century-old saw manufacturing concern. The company will be operated as the Atkins Division of Borg-Warner. A branch factory of the Atkins company in Portland, Oreg., is included in the transfer of ownership and will be operated as a unit of the Atkins Division.

Enter Mill Supply Business

Neil C. Muldock, works manager, General Electric Co.'s South Scranton dishwasher plant, for more than five years, and two other local GE executives are resigning from the firm to establish an industrial mill supply business in Scranton, Pa. Mr. Muldock will resign as of Nov. 1 to join Frank G. Harrington, supervisor of purchasing, and Fred G. Oblom, manufacturing engineer, in operating the newly established firm of Franeil Inc. Resignations of Messrs. Harrington and Oblom will become effective Oct. 1. Headquarters of the new firm will be opened about Oct. 1 at 513 Lackawanna Ave. Industrial supplies will be stocked to permit immediate delivery. The concern will represent a number of manufacturers.

Herring-Hall-Marvin Expands

Herring-Hall-Marvin Safe Co. of Canada Ltd. opened a manufacturing unit in Toronto, Ont. The firm is a subsidiary of Herring-Hall-Marvin Safe Co., Hamilton, O. Machines for heavy steel work are being installed in the new Toronto plant and production is to get under way immediately.

Overly Mfg. Plant Damaged by Fire

Considerable machinery, equipment and materials were destroyed by fire at Overly Mfg. Co.'s metal door and sash manufacturing plant in Bakersfield, Calif.

Olin Forms Ramset Division

Olin Industries Inc., East Alton, Ill., established Ramset Division as its ninth operating division and appointed J. E. Williams as general manager. Ramset Division will be responsible for development, production and sale of powder-actuated tools, fastening studs and accessories. It will operate the following Olin subsidiaries: Ramset Fasteners Inc., Stemco Corp. and Portable Instruments Inc., all located at 12117 Berea Rd., Cleveland.

Canada Machinery Names U. S. Agent

Canada Machinery Corp. Ltd., Galt, Canada, appointed Pitnam Industrial Products Co., a division of Cement & General Development Corp., New York, as its representative in this country. Canada Machinery makes lathes, shapers, slotters, bolt cutters and various special purpose machines.

Peck & Harvey Doubles Capacity

Peck & Harvey, manufacturers of reproduction equipment, purchased a larger building at 5650 N. Western Ave., Chicago. This project will more than double the firm's capacity.

Dominion Wheel Builds Plant Addition

Dominion Wheel & Foundries Ltd. is completing erection of an addition to its plant in Toronto, Ont., to provide for more efficient operations. This will give an increased capacity for making gray iron, chilled iron and alloy iron castings to the extent of another ten tons daily. Completion of the addition is scheduled for September.

Raybestos-Manhattan Opens Branch

Raybestos-Manhattan Inc., Passaic, N. J., opened a warehouse at 3012 Canal St., Houston. Principal products carried will be conveyor belting, transmission belting, V-belts, industrial hose of all types, and asbestos and rubber packing. The warehouse is in charge of M. C. Nugent and operates under the Dallas office, E. W. Nagel, manager.

Connor Moves San Francisco Plant

Connor Spring Mfg. Co., San Francisco, moved its plant and general offices to 75 14th St., that city. The new location offers expanded manufacturing space and facilities. The Los Angeles plant and offices remain at 3901 S. Broadway Pl.

National Distribution Plan Offered

Manufacturers who sell nationally but have no jobbers or other local outlets for their products will be able to make on-the-spot deliveries from local stocks to be kept in strategically located depots through the country. This distribution plan is offered by National Equipment Manufacturers' Depots, 805 Francis Palms Bldg., Detroit 1. This organization not only will warehouse a product, but also will take and fill local and out-of-town orders, accept telephone messages, forward literature and product information and perform other services. By limiting its service to small products, such as valves, gages, mo-

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United States Drill Head Expands

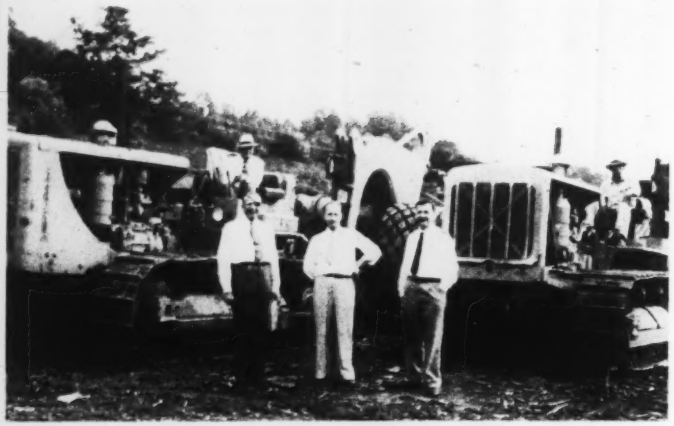
United States Drill Head Co., Cincinnati, manufacturer of fixed center and multiple spindle drill heads, purchased an additional building, part of which will be used by the newly expanded engineering department.

Nox-Rust Appoints Distributor

Nox Rust Chemical Corp., Chicago, appointed N. T. Gates Co., Philadelphia, as its distributor for rust preventive oils and compounds and vapor phase corrosion inhibitor paper in that territory.

Wallace & Tiernan To Boost Output

Wallace & Tiernan Ltd., machinery and apparatus manufacturer, is constructing a plant in Toronto, Ont., which will have about 13,500 square feet of floor space and will boost productive capacity about 50 per cent. Completion is scheduled for December.



Putting Their Best Foote Forward for Lithium

Foote Mineral Co., Philadelphia, is building a new lithium plant at Sunbright, Va., to be completed within a year. Chemical Plants Division of Blaw-Knox Co., Pittsburgh, will build the plant, said to be one of the world's largest such installations. Together with Foote's plan to mine lithium ore and quarry and process limestone, the plant will double U. S. output of the light metal. Among its uses are in lithium hardened bearing metal alloys, aluminum soldering, pyrotechnics, refrigerating machines, glass making and electrical porcelains

Miller Dial Erecting Building

Miller Dial & Name Plate Co. will construct a building at 800 Temple Blvd., El Monte, Calif., to manufacture serial number identification name plates and decals used on aircraft and aircraft equipment. The company is located at 781 E. Washington Blvd., Los Angeles, and will move the first of next year. Mr. Dawson Miller is president.

Lukens Builds Maintenance Building

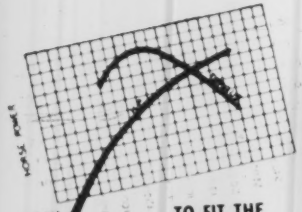
Lukens Steel Co., Coatesville, Pa., is building a $1 million centralized maintenance building which will house several departments and store rooms now scattered throughout the plant. The project is expected to be completed early next year.

Filtrol Plans Chemical Plant

Filtrol Corp., Los Angeles, will construct a $5 million waste products chemical plant adjacent to the present facilities at Vernon, Calif. The plant will produce ammonium sulfate and alumina and is scheduled for completion by the fourth quarter of 1953.

Machinery Plant Opened in Canada

Canadian Machinery & Industry Construction Ltd.'s, $5 million plant at St. John's, N. F., was opened recently. This is the largest plant so far established under Newfoundland's economic development program, and is a subsidiary of Mag Ltd., Germany. The plant will produce all types of heavy machinery on order. As it stands, the plant contains 150 machines from lathes to heavy planers and in addition has 100 ancillary machines and 28,000 different tools.



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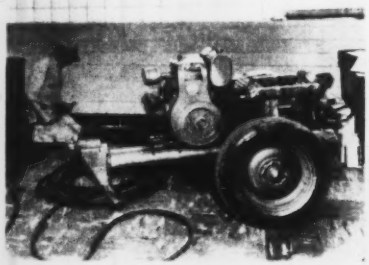

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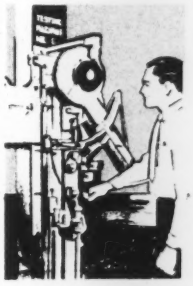

Johnson XLO Music Wire, "the wire of a thousand uses" —high-grade springs and wire forms difficult of formation. Johnson makes this wire better in order that your products may be better. Where service required is exacting, you can depend on Johnson XLO Music Wire.

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JOHNSON STEEL and WIRE CO., INC.

Worcester 1, Massachusetts

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aetna-standard completes two-year expansion program

• The two-year expansion program gives Aetna-Standard additional facilities to meet delivery schedules for tube mills, flat-rolled equipment, wire-drawing products, drawbenches and other machinery for the metal industry.

At the big Ellwood City plant . . . a new Roll Foundry features foundry handling equipment and many innovations. Additional assembly and machine shop capacity has been added, augmented by many new machine tools. Executive offices are now located in the Frick Building, Pittsburgh, Pa. . . . General Offices in Ellwood City.

Aetna-Standard recently completed 50 years of Creative Engineering service to the ferrous and non-ferrous industries and looks forward with confidence to another fifty.

BUYS RUBBER & PLASTICS MACHINERY DIVISION OF National-Erie

The facilities of the Warren, Ohio, plant will be used primarily for the production of machinery for the rubber industry. Aetna-Standard has purchased the patterns, drawings and some machinery of the rubber and plastic products division of the National-Erie Corporation, Erie, Pa., subsidiary of Bucyrus-Erie Company.

ASSOCIATED COMPANIES

Head Wrightson Machine Company, Ltd., Middlesbrough, England — Great Britain, Finland, Sweden, Norway, Denmark, Union of South Africa, Northern and Southern Rhodesia.

Aetna-Standard Engineering Company, Ltd., Toronto, Ontario, Canada.

M. Castellvi, Inc., New York, N. Y. — Mexico, Central and South America.

Societe de Constructions de Monthard, Paris, France — France, Belgium, Holland, Luxembourg, Switzerland.

Demag Aktiengesellschaft, Duisburg, Germany — Germany, Austria, Yugoslavia, Greece, Turkey, Egypt.

Compagnia Italiana Forme Acciaio, Milano, Italy — Italy.

Aetna-Japan Company, Ltd., Tokyo, Japan — Japan.

Hale & Kullgren, Inc., Akron, Ohio — Representative for the Rubber Industry.

Designers and Builders to the Ferrous, Non-Ferrous, Leather and Rubber Industries

Aetna-Standard

THE AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

Plants in Warren, Ohio • Ellwood City, [illegible]vania

More plate...less wait...from leveller on TIMKEN® bearings

TO insure continuous sheet leveling production, Mesta Machine Company mounts the backing-up rolls of its spindle-driven levellers on Timken® tapered roller bearings.

Timken bearings hold shafts in rigid alignment. They reduce drag between rolls because of their true rolling motion and incredibly smooth surface finish. As a result, rolls start quicker even when subjected to terrific separating forces.

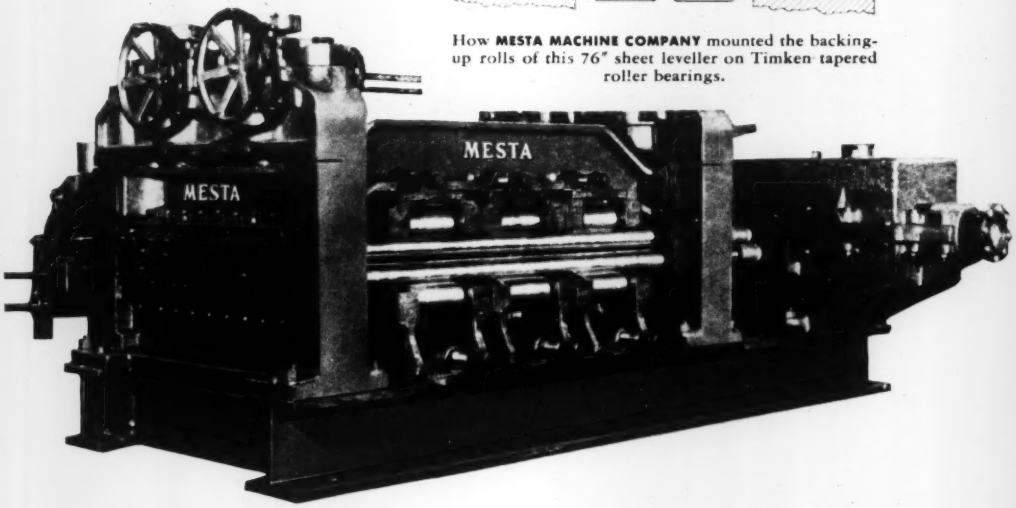
Due to their tapered construction, Timken bearings take both radial and thrust loads in any combination. Special thrust units are eliminated. And mounting or changing rolls is simpler, quicker.

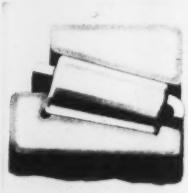
Line contact between the rollers and races of Timken bearings permit extra load-carrying capacity. Because they hold roll and housing concentric, they make closures more effective. Lubricant stays in—dirt and moisture stay out.

Timken bearings are now used on the back up rolls of practically all levellers. Make sure the bearings in the machines you build or buy are stamped with the trade-mark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

How **MESTA MACHINE COMPANY** mounted the backing-up rolls of this 76" sheet leveller on Timken tapered roller bearings.





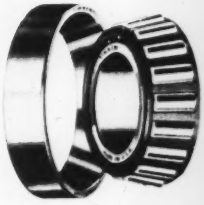
GREATER LOAD AREA

Because the load is carried on the *line* of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special alloy steels.

TIMKEN

TAPERED ROLLER BEARINGS



NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION